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ARCHIVES OF OPHTHALMOLOGY.

RETINAL CHANGES IN ADOLESCENTS.[1]

BY ARNOLD KNAPP, M.D.

(With one colored plate.)

DURING the last few years a number of papers have been published describing retinal changes in adolescents, which appear not to be particularly uncommon, and have suggested a number of new clinical pictures. The changes in the retina are found to be associated with lesions in the retinal veins, and have been brought by some into relationship with tuberculosis. I have had the opportunity of observing several cases illustrative of these retinal changes, which seem to me to be of interest, as our knowledge of this subject is still imperfect.

CASE I is that of Louise M., 25 years old, who came on April 15, 1911, to ask whether anything could be done for her right eye, which began to fail five years ago. A diagnosis of vitreous hemorrhage was made by the physician who then saw her. Not much attention was paid to this condition, and the sight was entirely lost some months ago.

The patient is pale, poorly nourished, and has always been delicate. She has, however, had no illness except diphtheria. Her father died of Bright's disease; her mother is living. Two other sisters are healthy. One brother is tuberculous and is now being treated for an eye trouble, which will be fully described later on. One other brother died of tuberculosis of the bladder.

On Examination.—Right eye is blind; the anterior segment of the eye is normal; the retina is totally detached, so

[1] Read before Section on Ophthalmology, N. Y. Acad. Med., November 18, 1912.

that the disk is recognizable only by the confluence of the vessels; the detachment is generally shallow; above, it is translucent, giving a faint pink reflex, and cholesterin crystals can be seen in the subretinal fluid. In the lower half underneath the detached retina there are a number of large yellowish-white exudates. The vessels in the detached retina show no peculiarities; there are two small round white areas near one blood-vessel. She has no complaint about the left eye, and the vision is normal. After dilatation of the pupil, a remarkable condition is found in the retinal veins in the periphery of the fundus (see drawing). The vitreous is clear. The optic nerve is congested and blurred, but not elevated. There are two small hemorrhages near the temporal margin. The changes in the retinal veins consist in round areas which measure about $\frac{1}{3}$ of a papilla diameter. These areas are in direct relation to the retinal veins. The one in the lower field covers the vein, the margin is sharp and not pigmented, the color yellow. The one in the temporal field is situated on one side of the vein, which describes a distinct curve as it forms the margin of the area; this also has no pigment, is sharply defined, and of an ochre-yellow. The one in the upper periphery is slightly larger, distinctly grayish, with indefinite outline, and surrounded by a pale ring without pigment.

She would not permit a diagnostic tuberculin test, but because of the exact similarity of the ophthalmoscopic picture of the right eye to the condition in her brother's eyes, which will be described later, she was given the usual tuberculin treatment for about four months. During this time the ophthalmoscopic picture changed but little. The hemorrhages near the disk were absorbed and the phlebitic area in the upper periphery changed to two faint round foci surrounded by a pale ring. The patient then suddenly ceased attendance, and, on inquiry, we learned that she had become demented and had to be taken to the State Hospital for the Insane at Morris Plains, N. J., where she died, after a few days, from exhaustion. The hospital authorities saw no evidences of a tuberculous meningitis; no autopsy was performed.

CASE II.—The brother's case, from its bearing on our patient's condition, deserves some attention. J. L., 18 years old, states that the sight in the left eye was lost 1½ years ago. The right eye began to fail on July 1, 1910. He complains of headache, night sweats, but has gained in

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weight. The boy is tall, rather apathetic, and poorly nourished. Purulent discharge from nose; right eye, on inspection, normal. V. = $\frac{2}{200}$. Field contracted to small area temporally from center; Wassermann negative. In both eyes the ophthalmoscope shows a detachment of the retina, proliferating retinitis, a hole in the retina (in the periphery), many large subretinal exudates, cholesterin particles, small hemorrhages in the retina, and in the periphery some retinal striæ. A diagnostic tuberculin injection gave a marked general reaction; unfortunately the presence of an ocular reaction is not noted in the history-record. He has come regularly for tuberculin treatment until his sister's death, but without any benefit. On November 11, 1912, the left eye presents the picture of an irido-choroiditis, with closure of the pupil, cataract, and secondary glaucoma. The right eye now has uncertain light perception. The pupil is dilated. The vitreous contains a whitish mass (detached retina) with a white exudate and three vascularized yellowish nodules. These can be seen by oblique illumination directly posterior to the clear lens.

The ophthalmoscopic condition in the right eye of Case I, and in both eyes of Case II, suggests the changes after intraocular hemorrhage (retinitis proliferans, detachment, retinal hemorrhages, retinal striæ), though the shallow transparent detachment, cholesterin crystals, and large exudates under the retina resemble somewhat Coats's retinitis with massive exudation[1] (retinitis exudativa[2]). The process was known to have begun in the right eye of Case I as a large vitreous hemorrhage. The accidental finding of periphlebitic foci and slight neuro-retinitis in the other eye of Case II may throw some light upon the morbid process. In any case it shows the importance of a careful ophthalmoscopic study of the retinal vessels of an apparently normal eye, if the other eye is affected. The nature of these round areas is hard to explain without an anatomic examination. They are unquestionably in the retina and are closely connected with the veins. They may be miliary tubercles, though their appearance is not quite that of the well-known miliary tubercles in the choroid. During an observation period of four months, they practically remained unchanged.

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[1] *Royal London Ophth. Hosp. Reports*, vol. xvii., p. 440, 1908.

[2] *Arch. f. Ophthalmologie*, vol. lxxxi., No. 2, 1912.

CASE III.—F. E. C., 23 years of age, tall, muscular, of good family history, stated, on June 14, 1907, that the vision in the right eye had been failing for four weeks. S. = $\frac{1}{200}$. The field shows peripheric contraction and a central scotoma. An extensive vitreous hemorrhage is present, and no details can be seen. The vision in the left eye is normal; the retinal veins are congested. He was treated with sweats, mercurial inunctions, potassium iodide, subconjunctival injections, without avail. On April 17, 1908, S. = $\frac{2-3}{200}$; an extensive detachment of the retina is present, with new-formed connective tissue on the detached retina and new blood-vessels. There are a few recent hemorrhages. The left eye is normal, though the veins are congested.

On February 12, 1909, he was seen again, stating that he had noticed fire-like streaks in the left, his good eye. On his looking down, with the ophthalmoscope a retinal vein is seen interrupted by a superimposed white patch, the lymph sheath about the vein appears injected, and there are many surrounding hemorrhages. He was thoroughly examined by Dr. Theodore Janeway, who found retarded blood coagulation and slight albuminuria. In April, 1910, a large hemorrhage occurred. He consulted several oculists; one of these, Dr. de Schweinitz, suggested tuberculin treatment. Dr. de Schweinitz very kindly informed me that the tuberculin test gave a general reaction, and during that winter he was given tuberculin injections by Dr. Baldwin at Saranac. I saw the patient again on June 1, 1911. The fundus examination revealed some peripheric hemorrhages in the retina. At the site of the previous periphlebitis, the vein forms a loop, turns back upon itself, and there is some connective-tissue proliferation. In two other parts of the fundus the veins show vascular loops; there are some new hemorrhages, but no exudates.

Publication from the Hirschberg clinic (Friedenwald,[1] Simon, Fischer) described, in the recurrent hemorrhages of adolescents, changes in the retinal veins. According to Cords,[2] Hutchinson,[3] in 1881, drew attention to the same condition. The relationship to tuberculosis has recently been mentioned especially by Axenfeld and Stock.[4] These authors speak of these cases as "recurring hemorrhages in the tuberculous,"

[1] *Centralblatt f. Augenhlk.*, 1896.
[2] *Zeitschr. f. Augenhlk.*, vol. xxvi., Nos. 5 and 6, 1911.
[3] *Trans. Ophthal. Soc.*, vol. i., 1881.
[4] *Klin. Monatsbl. f. Augenhlk.*, vol. xlix., 1911.

and regard the inflammatory lesions as toxic and non-specifically tuberculous. Fehr[1] has made an anatomical examination of one of these cases, and found an infiltration of leucocytes in the walls of the veins. In the experience of some, the treatment with tuberculin in certain cases has been much more successful than any other.

CASE IV.—M. H., 18 years of age, consulted me by the courtesy of Dr. F. Tooke of Montreal, on December 11, 1911, stating that the sight in the left eye became blurred three months ago. The vision with correcting glass is $\frac{1}{10}$. The anterior segment seems normal; there are vitreous opacities; optic neuritis; the retinal veins are full. An exudate covers the superior nasal vein, and the inferior temporal vein exhibits an area of perivasculitis. The field, of distribution of the superior temporal vein, beyond the macula, is covered with small hemorrhages. At the bifurcation of the superior nasal vein, there are two small round whitish areas. A careful medical examination revealed nothing except a trace of albumin and a few hyaline casts in the urine. A diagnostic tuberculin injection was given, which was followed by a typical febrile reaction (100° F.), a reaction at the site of the injection, and a local reaction in the eye—*i.e.* the formation of three fresh hemorrhages near the bifurcation of the superior nasal vein. The patient returned home and was given tuberculin treatment with the result that, together with a gain in her general health, the fundus changes have all cleared up and her vision is normal in October, 1912.

Similar cases to this last one have been reported by Igersheimer[2] and others. The tuberculous origin of the retinal changes seems probable; at any rate, the result of the tuberculin treatment was striking.

In these three varieties of retinal lesions, occurring in adolescents, the primary pathological change takes place in the wall of the retinal veins. Cords (*l. c.*) states that certain cases of retinal periphlebitis, recurring vitreous hemorrhages, proliferating retinitis, and retinitis with massive exudation may be grouped together under the general heading of "Juvenile Retinal Augiopathy." Their relation to tuberculosis is

[1] *Centralblatt f. Augenhlk.*, 1901.
[2] *Archiv f. Ophthalmologie*, vol. lxxxii., No. 2, 1912.

difficult to prove; the tuberculous origin in my cases seemed probable. The tuberculin treatment in one was successful; in one doubtful—the case is still under treatment; in two without avail.

EYE TROUBLES CAUSED BY THE USE OF HAIR-DYES.

By Dr. JUAN SANTOS FERNANDEZ, Havana, Cuba.

FOR a long time we have been consulted almost daily, by women especially, in regard to the possible danger to the eyes and the sight from hair-dyes, used mostly to hide the whitening of the hair. Formerly our knowledge of this danger was obtained only through hearsay, as we had no opportunity of seeing any of these cases among our patients, and it is only in recent times that any specific information on the subject has been given us by medical authorities.

It seems probable that diseases of the eye may be occasioned by the dyeing of the hair, and that benign complications are much more frequent than imagined, and are unrecognized by the ophthalmologist because most of them have no serious after-effects. The patient usually consults the family physician, and frequently not until after the symptoms have passed, in order that the use of the hair-dye may not be discovered. We must admit, however, that although the practice of using hair-dyes is general, the proportion of eye troubles resulting therefrom is very small; but clinical work recently has revealed so many cases, that the attention of ophthalmologists has been directed to the subject. As it seems impossible to prevent people from using hair-dyes, even after they have been warned of the dangers arising therefrom, some action should be taken to regulate the manufacture of such preparations. We would suggest an act of legislature placing the manufacture of hair-dyes and similar cosmetics in the hands of chemists or other persons skilled in the use of drugs, whose duty it would be to use the least harmful substances and to mix them accurately.

Although poisoning from hair-dyes may appear an insignificant matter, it has been the subject of comprehensive works by Orfila and Devergie. In spite of what has been written on the subject, however, the popular preparations continue in favor with the people. In 1846, Vimmer published in the *Annales de chimie*, of Berzelius, a note on the use of pyrogallic acid for staining the hair a solid red. The solution was to be left on for some time, and then the hair rinsed thoroughly to prevent burning by the acid. Cases where an entire growth of hair has been destroyed in this way have been noted by barbers, but we have unfortunately no particulars. Besides Orfila and Devergie, Chevalier and Gaultier de Clubry have tried to find out a thoroughly innocuous preparation. The following formula is ascribed to Debay of the Paris faculty:

Lead Sulphate	4 grams
Hydrated Lime	4 grams
Water	30 grams

The following is also attributed to some authority on chemistry, but is far from being harmless[1]:

Distilled Water	1 litre
Lead Acetate	15 grams
Ammonium Hyposulphite	30 grams
Alcohol	15 grams
Glycerine	15 grams
Tinct. Bitter Almonds	10 drops

We have observed in the use of aniline preparations which are applied in shops where there is abundant water to wash off the excess of coloring matter, that the absorption was less frequent than when the application was made at home with less skill and insufficient rinsing of the hair. And if to this we add the practice of excluding the air from the head in order to obtain better color results, the probabilities of absorption are greatly increased.

Berger[2] observed not long ago one case of central scotoma with the vision reduced two-tenths, without discovering any lesion by the ophthalmoscope. Larmarque described a case of exophthalmos from orbital œdema, ocular hypertension,

[1] *Des teintures pour les cheveux et leurs dangers*, Henri Jouve, Paris, 1898.
[2] *Arch. f. Augenhlk.*, 1904.

chemosis, and lachrymation. Chiari,[1] of Milan, has published a case similar to Berger's, in which, in spite of reduced vision, positive scotoma, and dyschromatopsia, the symptoms in the fundus were absent, and it was believed to be a retrobulbar neuritis. Laboratory experiments have proven the existence of an interstitial neuritis, localized in the optic nerve, and the eye troubles due to atoxyl may be attributed to the arsenical derivatives which are present in the modern hair-dyes and cosmetics. Affections of the eye caused by atoxyl were, as is well known, the basis of Ehrlich's rule of caution in applying 606 to persons afflicted with any vital ocular trouble. This precaution, however, is being disregarded, and to-day many ophthalmologists apply 606 without any risk.

The irritant action of many of the hair-dyes gives rise to the formation of vesicles on the scalp, the dried fluid from which produces crusts and causes the hair to fall out in tufts. This condition is accompanied by intense itching of the scalp; general indisposition and lowness of spirits, followed by vertigo; slight renal disturbances are frequently seen, and sometimes albuminuria or even uræmia may set in; cephalalgia, sleeplessness, dyspnœa, delirium, arrhythmia, and vomiting may occur, and there is almost always œdema of the face and eyelids. The ocular disturbances may at times be the only sign of poisoning, and they may occur without pruritus or other skin disorders; in the case published by Chiari, they were followed only by headache and vertigo. Some authors consider dermatitis to be the result of the poisoning; but we believe it the portal of absorption, because the irritation of the skin and the accompanying vesicles make the process of absorption very much easier. The effects, however, are due in most cases to the nature of the coloring substance and the susceptibility of the user. The œdema extends to the eyelids and closes them, and as this condition is usually followed by chemosis, the patient experiences great difficulty in opening his eyes and is, consequently, much alarmed. In most of the cases observed by us, the vision was not impaired, because as soon as the œdema of the eyes subsided, the patient got well; the fundus was not affected. Hair-dyes may be divided into four classes:

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[1] *Annali di Optalmologia*, vol. xxxviii., p. 882, 1910.

1. Decolorizing (H_2O_2).
2. Vegetable Tinctures (less frequently used).
3. Tinctures with metallic basis; (dyes more frequently used; among which are: caustic potash, nitrates of silver and mercury; bismuth, acetates of lead and copper, nitric and sulphuric acids, and sodium hyposulphite).
4. Tinctures based on aniline derivatives. (In this class should be placed most of the modern hair-dyes.)

According to investigations made in the physiological laboratory of the Academy of Sciences, of Lyons, chlorinated paraphenylendiamin has a marked toxic influence on the system, its effect being compared to that of the ptomains. A monograph of Dr. G. Tissot, of the Paris University[1] which has kindly been loaned to me by my friend Dr. A. Gonzales Curquejo, of this city, contains a great deal of information in regard to hair-dyes, and is the most complete work I have read on the subject. Dr. Tissot gives proof that, although most of the dyes are advertised as vegetable compounds, they are in reality based on aniline derivatives treated with nitric acid. It is only necessary to saturate the hair with a solution of paraphenylendiamin salt and H_2O_2 prepared as used, in order to produce a true aniline color; this possesses the real strength of an aniline solution and also its undoubted toxic characteristics. Not all preparations, of course, work in the same way; each one gives rise to certain disturbances according to the various drugs of which it is composed. The use of sulphur and its derivatives, mercurial and lead salt, results in cutaneous endosmosis, and traces of the drug appear in the urine before the appearance of any skin affections; while with the use of pyrogallic acid, silver nitrate, and phenylendiamin the skin eruption is seen before any symptoms of toxicity. My conclusions are as follows:

FIRST: All hair-dyes in use at the present time are more or less toxic in effect, and may give rise, under certain circumstances, to general and local eye troubles.

SECOND: The injurious effects experienced are of two classes,

[1] *Des teintures pour les cheveux et leurs dangers*, Henri Jouve, Paris, 1898.

inflammatory and toxic, although both may be present at the same time. The trouble may be only ocular in character, or it may affect the general system as well as the eyes from the start.

THIRD: The dyes which do the most harm are those containing aniline derivatives. As they are very easily prepared, these are the dyes most generally used.

FOURTH: Fortunately as the aniline derivatives are powerful colorants, a smaller quantity of the dye is necessary to produce the desired results, and there is, therefore, less danger to the eyes and the general health.

PERIBULBAR IMPLANTATION CYST AFTER REMOVAL OF STAPHYLOMA OF CORNEA.

FROM THE GERMAN UNIVERSITY EYE CLINIC, PROFESSOR A. ELSCHNIG, PRAGUE.

BY DR. BERNARD SAMUELS, NEW YORK, VOLUNTARY ASSISTANT.

(With three figures on Text-Plate I.)

IN the entire literature there are to be found but few cases of large subconjunctival cysts, occurring after excision of staphyloma or exenteration of the eyeball. For this reason, and more especially because of its great size and the extent of orbital tissue invaded, the cyst described below would seem of particular interest.

History.—J. L., a laborer, aged 30, was admitted to the hospital, August 1, 1906. Six weeks before, a piece of coal blew into the right eye. An ulcer formed which was treated with drops and salve, but without improvement.

Examination.—Slight eczema of the lid, severe conjunctivitis, ciliary injection, photophobia, lachrymation. A staphyloma involves about three-fourths of the cornea, leaving only the lower margin unchanged. Slight scleral ectasia is present in the upper ciliary region.

Tension. — 1.

Vision. Hand movement before eye.

Light Perception. Candle at six meters.

Operation.—The conjunctiva was freed around the limbus. The four recti muscles were tenotomized, and each secured with a suture. The staphyloma was next excised. The free edges of the sclera were coaptated by sutures. Over the closed sclera the muscles were drawn and fastened. Suturing the conjunctiva to cover the wound completed the operation.

ILLUSTRATING DR. BERNARD SAMUELS'S ARTICLE ON PERIBULBAR IMPLANTATION CYST AFTER REMOVAL OF STAPHYLOMA OF CORNEA

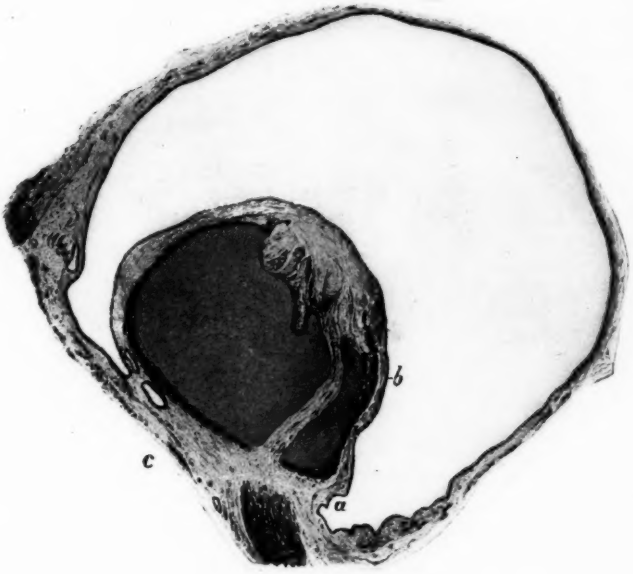

FIG. 1. Loup Magnification.

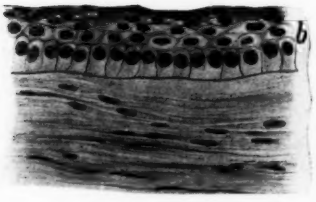

FIG. 2. Mag. 450.

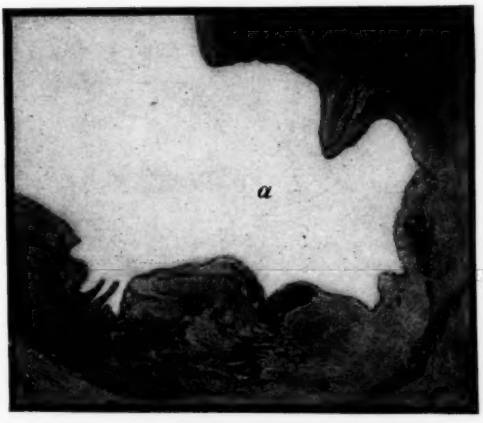

FIG. 3. Mag. 35.

The next day, patient was discharged.

In a year and a half the man came back to the clinic, and was fitted with a prothesis.

On January 19, 1910, over three years after the operation, he again returned, and related that for twelve months he had been unable to wear the prothesis.

Examination.—A cyst-like body, not unlike a fish bladder, fills the space normally occupied by the eyeball. The conjunctival covering can be but slightly elevated, being especially adherent over the central part, with numerous dilated blood-vessels crossing it. The formation appears to be divided into an inner and an outer half. The inner half is the more prominent, being pointed like a cone, and drawing the semilunar fold up with it. The transilluminating lamp gives the body a bright red appearance, without the slightest shadow anywhere.

Operation.—The enucleation was done under "ganglion anæsthesia." The conjunctiva was liberated, except over the central area, where it could not be detached without opening the cyst. The cyst proved to be irregularly spheroidal in shape, occupying an area in the orbit much larger than the normal eyeball. A small incision was made in the wall of the cyst, liberating a clear, limpid fluid. By enlarging the incision, the shrunken eyeball, with remains of sutures still visible, came to view. The eyeball lay at the bottom of the cyst, enveloped in its delicate wall, like a blossom in its calyx. The whole cyst with the eyeball was dissected out.

Microscopical Examination.—Extending across the anterior pole of the shrunken eyeball and opening outward and backward in all directions is the cavity of the cyst (Fig. 1). On the nasal side it reaches to a point considerably posterior to the entrance of the optic nerve in the sclera (Fig 1a). Here the cyst forms a cul-de-sac, embracing the median aspect of the optic nerve. Only the posterior outer quadrant of the globe remains imbedded in normal tissue (Fig. 1c). The rest of its surface is invaginated in the wall of the cyst.

The outer wall of the cyst is composed of tough, poorly nucleated connective tissue of varying thicknesses. This wall is in the grasp of the recti muscles as they come forward to their attachment at the anterior pole. The thinnest and smoothest portion of the wall is at the nasal side, where the cyst bulges the most. In the cul-de-sac only a very thin layer of fibrous tissue is interposed between the cavity of the cyst and the dural sheath of the optic nerve (Fig. 1a). The ciliary arteries and nerves in this region are displaced by the cul-de-sac backward and inward on their way to the

sclera. At some places in the outer wall, small cysts occur between its layers. They are lined with epithelium, and most of them may be recognized to communicate with the large cyst within. Some of them appear to be like secondary epithelial blossoms that have grown into the wall of the cyst.

The eyeball measures in the sagittal diameter 12*mm* and in the transverse diameter 15*mm*. The sclera, which forms the inner wall of the cyst, is everywhere closed, so that no communication exists between the interior of the eyeball and that of the cyst. The anterior pole is replaced by a mass of scar tissue and striated muscle bundles. It has lost much of its spheroidal contour, particularly on the nasal side where it is quite flattened out. This is due probably to three factors: the contraction of the scar tissue at the anterior pole, to the drawing in of the wall by the cyclitic membrane within, and to the pressure exerted by the cyst without.

In the outer posterior ramifications of the cyst a few thin bands of connective tissue stretch between the walls as remnants left in the process of separation of the two surfaces.

A coating of stratified epithelium lines the entire cavity of the cyst. It has no basement membrane of its own, but lies everywhere in immediate contact with the connective tissue of the walls (Fig. 2). The number of layers composing the epithelium varies somewhat in different locations. On an average there are three to six layers of cells. As a rule the lining is thicker over the sclera than over the external wall. On the nasal segment of the external wall, where the wall itself is thinnest and smoothest, there are the fewest layers of epithelium.

Tufts of epithelial cells, especially in the recesses of the mass of scar tissue anteriorly and in the cul-de-sac posteriorly, grow out in the lumen of the cyst, like villi. In other places the epithelium dips down into the folds like secondary blossoms of epithelium, giving on cross-section the appearance of papillæ. The free surface of the epithelium of the outer wall is for the most part sharply defined and quite free of debris. That of the inner wall is generally quite ragged from disintegrating cells (Fig. 3).

The individual cells of the layers are also altered to an extent, according to where situated. As a rule, the lowermost layer consists of cuboidal cells, with well staining rounded nuclei, placed at the base. Often the cells of this layer are columnar, with a slightly œdematous protoplasm, and large oval nuclei, placed in the long axis of the cell. The middle layers are made up of rounded or polyhedral

cells, usually with oval, horizontally directed, and slightly staining nuclei. The innermost layers are almost everywhere pavement cells (Fig. 2).

The fluid of the cyst contains cell debris.

The interior of the eyeball presents the characteristic appearance of an atrophic eye. The retina is everywhere detached, and runs in a funnel from the optic nerve to the heavy cyclitic membrane anteriorly. In the cyclitic membrane are rests of the lens capsule.

The optic nerve is almost completely atrophic. From sections stained with Weigert-Pal's hæmatoxylin stain, that portion of the nerve next to the cul-de-sac appears to be more atrophic than the rest.

We have described above a cyst lined with epithelium, which developed after the removal of a corneal staphyloma, and which entirely surrounded a shrunken eyeball. To the present time only four analogous cases have been reported: Kroll (1), Possek (2), Loevenich (3), and Boer (4). In every one of them the cyst followed the excision of a cornea staphyloma. In three (Kroll, Loevenich, Boer), they were situated not entirely epibulbar, but extended through the unclosed corneo-scleral junction into the interior of the eyeball.

In the case of Possek, on the contrary, the cyst was epibulbar, without any communication with the interior of the eye.

In regard to the cause, the cysts of Possek and Boer were due, following the opinion of the authors, to an invagination of the conjunctiva by the sutures. Loevenich attributed the cysts to an implantation of conjunctival epithelium. He cited in favor of his theory the well known implantation cysts in the anterior of the eyeball, that occur after perforation at the corneo-scleral junction.

The cysts so far reported have all been confined to the anterior part of the eyeball. The one described by us here spreads posteriorly to the optic nerve, invading the entire space of Tenon, and hence attaining the greatest growth of any cyst of its kind on record.

Without doubt, we have here to do also with a case of implantation cyst. It seems to me idle to discuss whether these cyst formations take their start from an invagination of conjunctiva at the time of suturing, or through an ingrowing of

the conjunctival epithelium during healing of the wound, or, finally, a thing analogous to the origin of cysts in the anterior chamber, whether implantation of particles of epithelium does not take place under the sutured conjunctiva.

When one considers the well known property of transitional epithelium to proliferate, especially that at the limbus, it is to be wondered that implantation cysts are not more frequent after extirpations of staphylomas, exenterations, and enucleations. It may be mentioned at this point that Elschnig[1] records the appearance of small cysts in scars after squint operations. At all events, the cases observed give the indication that all wounds in the conjunctiva, as well as those made in the removal of staphylomas of the cornea, should be accurately sutured. Elschnig employs, therefore, the tobacco-pouch knot, which never fails to bring about an exact adaptation of the edges of the wound.

Whether an implantation cyst will develop into a purely epi- or peri-bulbar cyst, or whether it will invade the interior of the eye, depends largely on the manner in which the wall of the eyeball is closed. For example, after the removal of a staphyloma, if the corneo-scleral wound is sutured, there is every probability that an implantation cyst in this case would be purely peribulbar. On the other hand, after the removal of a staphyloma, without suturing the eyeball, as is so often done, if the conjunctiva alone is united by a tobacco-pouch knot, there is very small likelihood of implantation of epithelium in the interior of the eye.

For the opportunity to report this case, as well as for assistance in the study of it, I am greatly indebted to my chief, Prof. Dr. Anton Elschnig.

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[1] Czermak's *Die Augenärztlichen Operationen, herausgegeben von Elschnig*, I Bd., S. 527.

ILLUSTRATING DR. TOOKE'S ARTICLE ON CALCAREOUS DEGENERATION OF THE CORNEA AND LENS CAPSULE.

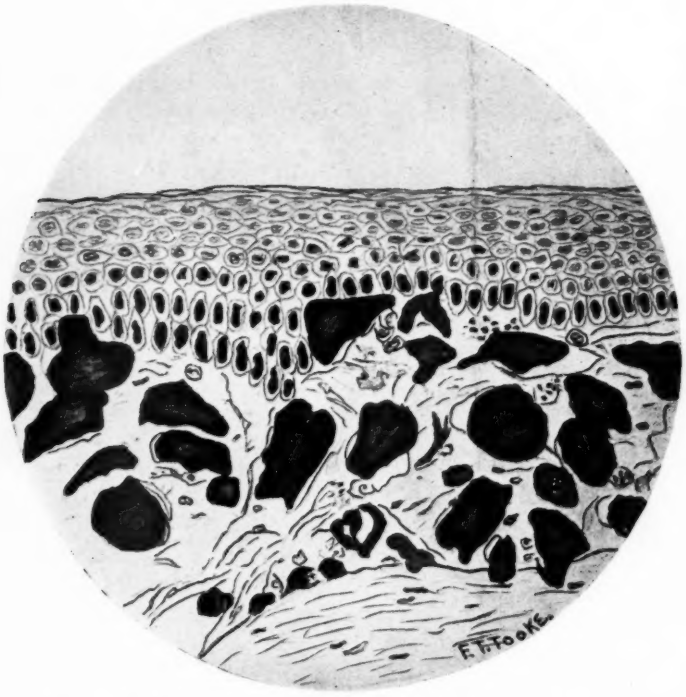


FIG. 1.—Reichert. Obj. No. 6. Polymorphous plaques in superficial layers of substantia propria as well as occupying the site of a degenerate Bowman's membrane. No evidences of a previous inflammatory disturbance. Section taken from center of pupillary area.

FIG. 2.—Reichert. Obj. No. 3. Occlusion of filtration angle; root of iris in opposition to Descemet's membrane, otherwise anterior chamber is of normal depth.

CALCAREOUS DEGENERATION OF THE CORNEA AND LENS CAPSULE.[1]

By Dr. FREDERICK TOOKE, Montreal, Canada.

(With two figures on Text-Plate II.)

LESIONS of the cornea manifesting calcareous changes have been variously described clinically as calcareous keratitis, primary or zonular opacity of the cornea, transverse film of the cornea, keratitis trophica and keratitis or "kératite en bandalette." Some authors have attributed these opacities to an excess of uric acid, while others consider them due to external injurious influences.

Referring to the ribbon-shaped variety of opacity, Ball[2] says that it may be either congenital or acquired; the former type is of exceedingly rare occurrence. In the acquired form it is present in two distinct clinical types; in the one the interpalpebral part of the cornea of eyes which were previously normal becomes opaque owing to the development of a smooth, subepithelial covering; in the other type an oval transverse band develops in eyes which have long been blind from iridocyclitis, sympathetic ophthalmia, or from glaucoma. This form of opacity produces a roughening of the cornea, and occurs chiefly in the lower third of this tunic. Since this is the part of the eye which is exposed when the globe is rolled upward, as in sleep, the condition has been considered to be due to imperfect closure of the lids while sleeping or in the course of exhausting diseases; in other words, an exposure keratitis.

In the first type the local change consists in a deposit of

[1] Read at meeting of American Ophthalmological Society, Atlantic City, June, 1912.

[2] *Modern Ophthalmology*, pp. 334–346, 349–351.

lime salts beneath the epithelium which is unaffected. The opacity is sharply defined, while the remaining cornea is clear. This opacity may form a gray area, 3 to 5 *mm* in width, passing across the cornea below the center of the pupil. There is frequently an oval opacity at the outer and another at the inner part of the cornea, separated from the limbus by clear corneal tissue. The two oval masses are connected by a bridge through which the pupil can be seen.

Lime salts may be deposited in the cornea either in connection with hyaline degeneration or without such association. Such deposits sometimes occur superficially as band-like opacities, sometimes as infiltrates of small particles, and occasionally in old scars as larger plate-like masses. De Schweinitz[1] has recognized a clinical condition of retrogressive changes with the deposition of hyaline masses and lime particles in thick corneal scars and staphylomata, and refers to various forms of treatment.

A lattice form of opacity of the cornea as described by Freund[2] is hardly comparable to the case under consideration. It is of hereditary origin, its commencement is gradual, and it reaches its full development between the ages of thirty and forty. The opacity is thickest in the center of the cornea, both eyes are also affected, and the deep as well as the superficial layers of the cornea are involved.

Gilbert[3] thinks that the calcification of superficial scars is secondary to hyaline degeneration, since the lime deposits are never found without the hyaline, while hyaline substance occurs alone; but it, in turn, is secondary to coagulated fibrin. When Bowman's membrane is not destroyed in leucomata, it is found to be involved in the degeneration. He further considers some disturbance of the local nutrition and metabolism as being the principal factor in producing the pathologic changes.

Fuchs[4] says that the anatomic changes which underlie zonular opacity of the cornea consist in the deposition of lime in the form of very minute granules in Bowman's mem-

[1] *Diseases of the Eye*, pp. 339, 361–362.
[2] *Graefe's Archiv f. Ophth.*, vol. lvii., 1903, p. 2.
[3] *Graefe's Archiv f. Ophth.*, 1909, vol. lxxii., S. 337.
[4] *Lehrbuch der Augenheilkunde*, ii Aufl., S. 243.

brane, which later becomes opaque, white, rigid, and brittle. In the spots where the calcification is far advanced one ordinarily finds new-formed connective tissue on Bowman's membrane, between it and the epithelium; owing to the presence of this tissue the surface of the epithelium tends to become irregular. Acting in the opposite direction the connective tissue pushes Bowman's membrane backward, causing breaks in it and displacement of the broken portions. In advanced cases minute granules of lime also make their appearance in the lamellæ of the substantia propria lying beneath Bowman's membrane.

So very little has been written upon this rather obscure form of corneal degeneration from a pathologic standpoint that I am presenting this case before the Society as one of interest and consideration.

E. P., a male, of French Canadian extraction, aged forty-two, came to the Royal Victoria Hospital, Montreal, complaining of recurring attacks of pain and inflammation in and about the eyeball. He stated that up to a year and a half previous to his admission the eye had been a normal, healthy one. At the time referred to, while working in a sand pit, some material was forcibly blown into his eye; he was temporarily blinded, and from his description of the course of events, a superficial ulcer of the cornea must have followed. The patient stated that he did not seek for special advice, and that the eyesight was gradually lost, completely so at a comparatively short time after the accident. Recurring attacks of pain and inflammation manifested themselves, subsiding only to recur with greater intensity. The attacks finally became so severe that he decided to come to Montreal for relief.

As seen at the eye clinic the patient was a strong, vigorous man, and healthy in all particulars save his injured eye. On examining the cornea, a round, dense scar was noted in the center completely covering the pupillary area. It occupied about the central quarter or third of the corneal surface, and was yellowish gray in color, and was but slightly flattened. The corneal epithelium was intact over this opacity, the substantia propria not staining with fluorescin, and there did not appear to be any ingress of superficial vessels into the apparently healed scar. The opacity completely covered the pupillary area, the peripheral fibers of the iris seemed to be normal, the anterior chamber was of normal depth and free from exudate. There was a very moderate

degree of circumcorneal injection with some congestion of the branches of the anterior conjunctival veins. The intraocular tension was distinctly raised, and perception of light was absent.

The eye was enucleated as blind, the result of an advanced glaucomatous process, and recovery was uneventful. After fixing the specimen in formalin, the eye was frozen and bisected. While doing so the lens became detached from the zonule, and when separated from the eyeball I further tried to cut it across, it cracked unevenly like an eggshell, a degenerate cortex escaping from within the calcareous fluid of very much the same consistence as egg albumin. The covering which I have described as an eggshell was white in color, perfectly regular and smooth as regards its surface, but rather rougher on its inner surface, although the color is unchanged. By treating a particle with dilute sulphuric acid a distinct effervescence occurs, liberating free carbon dioxid and forming the characteristic calcium sulphate or gypsum crystals, proving the substance to be a true calcium carbonate. Staining and mounting a small particle with Loeffler's methylene blue as well as with hematoxylin does not reveal any of the features of true bone tissue, the specimen showing up as an amorphous mass which appears to absorb the methylene blue particularly well.

The anterior portion of the eyeball was imbedded and mounted in celloidin, and sections stained with hematoxylin and eosin, with methylene blue, and with Van Gieson's stain. The sections show a distinct proliferation of the corneal epithelium over the pupillary area, the superficial cells being of the stratified type. Beneath the epithelial layer one comes upon Bowman's membrane, which is not wrinkled or altered at its periphery; at the center of the section, however, this membrane appears to have undergone a distinct degenerative change. At some points it appears to be swollen, at some places atrophied, and at others a certain degree of coarsely granular change has taken place in the membrane not noticeable in other tissues in the section. There is, apparently, no areolar or connective tissue between the epithelial layer and Bowman's membrane, and superficial vessels are not to be seen in the center of the section.

There appears to be a certain degree of hyaline degeneration beneath Bowman's membrane, the definite or distinct layers of the cells of the substantia propria manifesting a certain element of degenerative alteration seldom noted in non-inflammatory conditions of the cornea. About Bowman's membrane, and beneath it in these areas of hyaloid change, are large, irregular, amorphous masses which cut with a definite element of resistance and grittiness, leaving the corneal tissue about them rather shredded and torn. These masses stain regularly and intensely with methylene blue, as well as by hematoxylin; they stain particularly well with the iron hematoxylin as employed in Van Gieson's stain. These plaques are noticeable in the superficial layers of the substantia propria of the cornea, some, in fact the most, either in or directly beneath Bowman's membrane, while other deposits are seen above it, appearing in some instances to shove the epithelium away from the hyaloid tissue (Fig. 1). One can, in fact, notice certain instances where the salt appears directly contiguous with Bowman's membrane at one end, the crystal projecting upward into the epithelial cells in the opposite direction, while some of the epithelium would appear to undermine this deposit, apparently separating part of it from the hyaloid tissue beneath.

This deposit or concretion is distinctly most intense about the center of the sections, and is confined chiefly to the more superficial strata of cells. Microscopically one cannot detect the actual presence of any blood-vessels either of recent or of previous origin; further, one is able to note scattered throughout the superficial cells of the substantia propria but very few lymphocytes as evidence of an earlier inflammatory condition and possible vascularization. At the limbus, however, one may notice a deposit of these cells about the walls of the terminal superficial blood-vessels. One is hardly prepared to state whether this deposit has been laid down from the blood-vessels or through the lymphatics. In all probability the former idea would be substantiated from a view of the sections if one is to consider the evidence of Leber,[1] as well as that of Sachsalber,[2] who state that hyaline concre-

[1] *Bericht der Ophth. Gesellsch.*, 1897.
[2] *Beiträge z. Augenheilk.*, xlviii., 1901.

tions eventually become calcareous, but that calcification occurs also by primary deposition.

Regarding the ingress of these cells into the epithelial layer of the section, my findings would appear to bear out the statement of Parsons,[1] who finds that calcareous deposits in and on Bowman's membrane lead to its being broken up both vertically and longitudinally. He further states that the masses are frequently pushed up into the epithelium, which is always more or less altered, often degenerated, and atrophic. The same author also remarks on the presence of new connective tissue elements about the calcareous masses, attributing this to the irritation which they set up. Giant cells in some cases have been noticed; they are absent in the case under discussion.

The presence of a calcareous substance in the cornea not being anticipated clinically, chemical tests were not attempted with the fresh tissue before it was imbedded. The subsequent treatment of the sections when imbedded was only partly satisfactory, as they did not permit of a sufficient amount of lime salts to be deposited for a routine chemical examination. The treatment of the sections, however beneath the microscope under low power with dilute sulphuric acid produced a distinct effervescence; but disintegration of the lime salts with the celloidin was so intense that the character of the anticipated calcium sulphate crystals could not be distinguished.

On examining the filtration angle, one can notice a characteristic occlusion at this neighborhood (Fig. 2). The root of the iris is in apposition to Descemet's membrane for some distance, but the chamber itself is of normal depth. Although the iris would suggest a condition of chronic inflammation by a distinct infiltration of leucocytes, still there is no exudate within the anterior chamber, and synechiæ are not present. There is, further, but little engorgement of the vessels of the ciliary body, no plastic exudate can be made out upon the ciliary processes, and cyclitic dots are not present.

The condition in the cornea is not to be confounded with hyaloid degeneration, as noted in old leucomata, anterior staphylomata, and band-shaped opacity. This may also

[1] *The Pathology of the Eye*, vol. i., pt. 1, pp. 242–243.

appear yellow in color, and seem to project above the surface of the cornea. This condition is usually limited to the more superficial layers of the corneal tissue and appears microscopically as homogeneous, highly refractile globules. The earlier evidences are minute granules which coalesce to form round globules, finally into larger masses, which generally show their mode of growth, as Parsons further states, by accretion in their crenate edges. Such material is very insoluble, resisting most reagents with the exception of concentrated alkalis, and acids. Its staining properties, too, differ somewhat from that of calcium salts, absorbing acid fuchsin and methylene blue, but staining poorly, if at all, with hematoxylin. Weigert's fibrin stain colors the granules but not the larger globules; the reaction of other staining materials shows by the variety of effect that one is dealing in such instances with no stable chemical body. This is further demonstrated by the fact that amyloid reactions are occasionally given typically, but more frequently in an indefinite manner or not at all. The microscopic features of such lesions have been thoroughly discussed by Baquis[1] and others.

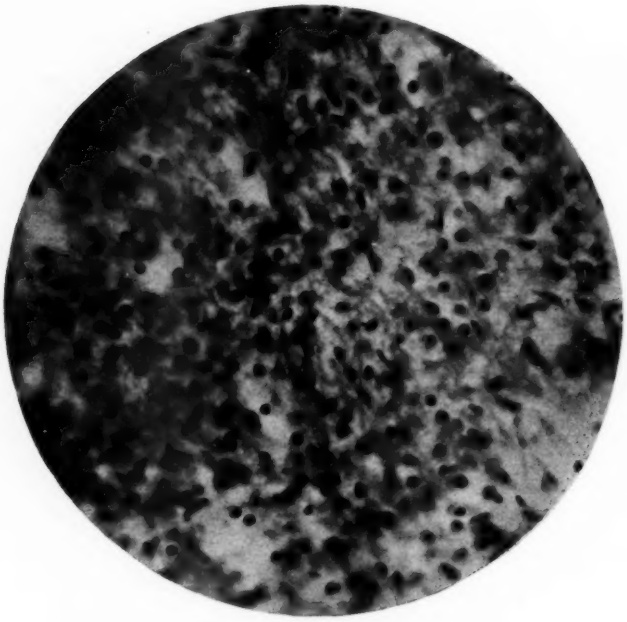
Regarding the condition of the lens capsule, I consider that I am dealing with a unique condition. It is known that calcification of the lens may occur within the intact capsule, and that it is frequently found in the final stages of complicated cataracts and in shrunken globes. Partial calcification is met with in old anterior capsular cataracts. Actual ossification of the lens can only occur after a rupture or wound of the enveloping capsule, since only under these conditions can osteoblasts gain access to the interior. H. Müller and Knapp[2] have denied the possibility of ossification, Virchow has doubted it, while Berthold[3] held that it had not been demonstrated. Parsons,[4] to whom I have already referred, says that there is no question as to its occurring in old shrunken globes after rupture or absorption of the capsule and invasion of the lens by connective tissue of cyclitic origin.

The condition in the lens, as well as in the cornea, is not to be confounded with that of an actual bone formation as

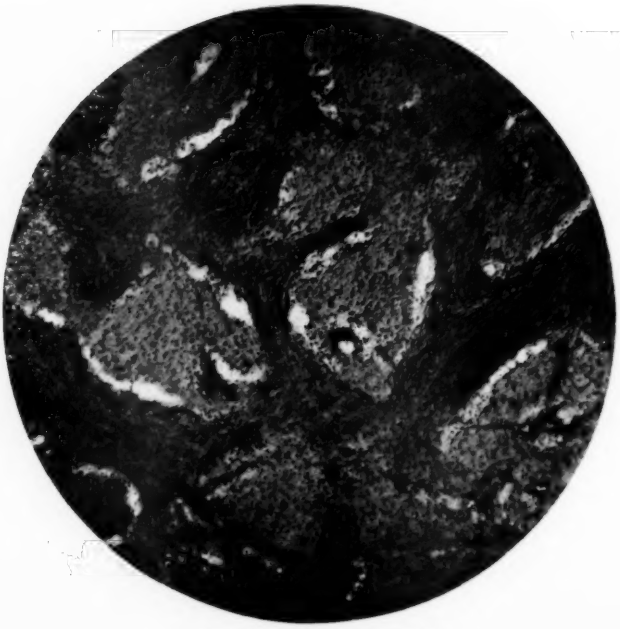
[1] *Archiv f. Ophthal.*, xlvi., 3, 1898.
[2] *Archiv f. Ophthal.*, xi., 1871.
[3] *Archiv f. Ophthal.*, xvii., 1, 1871.
[4] *The Pathology of the Eye*, vol. ii., p. 427.

found as a post-inflammatory feature in old atrophic eyes. The condition met with here I hold to be a primary degenerative process purely, not preceded by previous inflammatory alterations. The secretion of calcium salts in this instance is quite comparable to that form of degeneration exhibited in the formation of vesical or renal calculi. How the deposit of lime salts is laid down in the capsule I am unprepared to say. One can suggest, however, that with the complete calcification of the capsule necrosis of the cortex results with an ensuing autolysis or self-digestion of the lens fibers—a process quite different to bony degeneration, where the fibers of the cortex would be included in the pathogenic process. The occurrence of a deposit of lime salts in two separate hyaloid membranes of the eye is particularly interesting, and perhaps of some significance at the present time, in view of the diversity of opinion held by Wells and Klotz regarding calcareous alterations in the arteries; the former holding that the condition arises from hyaloid elements, the latter, that it is preceded by fatty degeneration.

ILLUSTRATING DR. SATTLER'S ARTICLE ON SHORT CLINICAL ACCOUNTS WITH MICROSCOPIC DEMONSTRATIONS OF TWO CASES OF TUMOR OF THE OPTIC NERVE.



CASE I. Transverse Section



CASE I. Van Gieson Stain

SHORT CLINICAL ACCOUNTS WITH MICROSCOPIC DEMONSTRATIONS OF TWO CASES OF TUMOR OF THE OPTIC NERVE.[1]

By Dr. ROBERT SATTLER, Cincinnati.

(With four figures on Text-Plates III and IV.)

I

FIBRO-SARCOMA OF THE OPTIC NERVE.

THE points of clinical interest were the slow growth of the tumor mass, with preservation of almost unimpaired vision until five months before the operation. At this period, increasing exophthalmus with irritability of the eye, from exposure, yet with perfect mobility of the globe, made surgical interference a necessity.

The tumor was removed with resection of the outer wall of the orbit (Kroenlein), the globe preserved, and the lids closed with temporary sutures.

Five days afterwards, excessive swelling and pain due to sphacelation of the cornea made enucleation necessary. A tedious recovery followed. Sixteen months later, the apex of the orbit was occupied by a dense, flattened, painless mass and there was also, at this time more than a slight prominence of the left eye, but without complaint or impairment of vision. Recent reports, almost two years since the operation, aside from considerable loss of weight, make favorable mention of the health of the patient.

Pathological Report.—The tumor is pyramidal in shape and has four sides with rounded edges, the base is almost rectangu-

[1] Read at the Forty-eighth Annual Meeting of the American Ophthalmological Society, June 12–13, 1912, Atlantic City.

lar. The optic nerve extends through the center of the tumor from the base to the apex. The surface is smooth with here and there a tab of orbital fat adherent. The tumor is of firm consistence and has a creamish-gray color. The widest of its four margins at the base measures 2.75*cm*. The length, from base to apex, is 3*cm*. Weight 8*gm*.

Microscopically, the tumor is found to be made up of rather dense fibrous tissue, infiltrated with small round cells in variable numbers. In places, these round cells are found in aggregations or clumps, closely packed together with a very small amount of intervening tissue. Here and there through the tumor, cells of the epithelial type, having a large oval nucleus, are found in the fibrous reticulum, a few cells having a spindle-shaped nucleus. The tumor had a few blood-vessels but is comparatively non-vascular.

The cross-sections containing the optic nerve show that the pia is normal; the pial septa are not thickened and the nerve itself, aside from containing a few nuclei belonging to adventitious cells, appears quite normal. The arachnoid is distorted and densely infiltrated with nuclei. On slightly more than half the circumference of the nerve, the dural sheath cannot be differentiated, evidently having been replaced by the new-formed tissue. In the remaining portion of the nerve's circumference, the innermost part of the dura contiguous with the intervaginal space can be traced as a delicate line, apparently but little altered, while the more external layers merge by insensible gradations into the tumor proper. While there is a slight tendency of the cells to become grouped in alveoli, and the presence of cells of the epithelial type, in a certain measure, suggests classifying the neoplasm as an endothelioma, the general morphology is quite different from that of the typical endothelioma. The neoplasm is a fibro-fying sarcoma of the round-cell type and should be classified, without further modification, as a fibro-sarcoma, apparently having its origin in the dura mater.

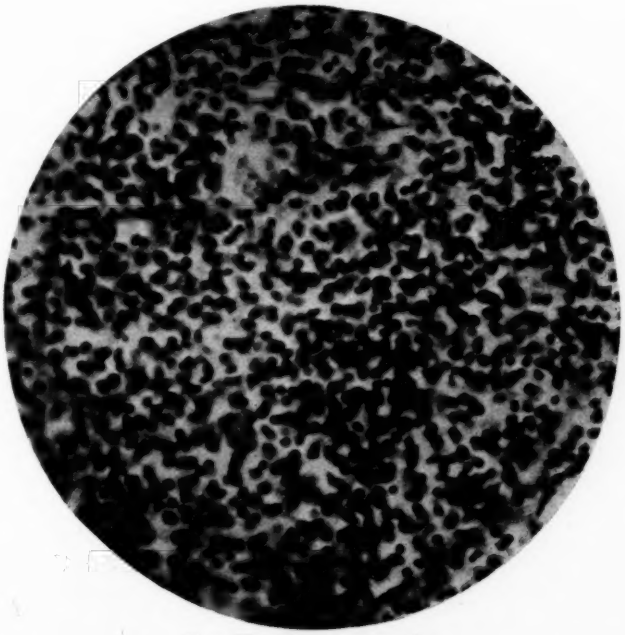
II

INTRA-DURAL FIBRO-SARCOMA OF THE OPTIC NERVE.

In this patient, a boy aged four, rapidly advancing exoph-

ILLUSTRATING DR. SATTLER'S ARTICLE ON "SHORT CLINICAL ACCOUNTS WITH MICROSCOPIC DEMONSTRATIONS OF TWO CASES OF TUMOR OF THE OPTIC NERVE

CASE II. Longitudinal Section



CASE II. Transverse Section

thalmus of the right eye was noted by the parents during the preceding five months, and during the last month, increasing irritability from exposure and insufficient lid protection were added. Aside from optic atrophy, there was nothing otherwise noteworthy. The child was fretful, but that was readily accounted for by the excessive irritability of the eye due to the marked proptosis. Perfect mobility of the globe remained. The removal of the tumor was accomplished without resection of the outer wall of the orbit and an encapsulated, hard, egg-shaped mass, fully one inch long was removed. The attachment to the apex of the orbit was firm and broad and its removal was only possible after careful dissection from the globe from which, as it was attached only by the optic nerve and its much thickened sheaths, it was easily separated. An attempt to save the globe was made, but in spite of every precaution it became necessary to enucleate it. This was done several days after the removal of the tumor. An uneventful recovery followed.

Fourteen months after the operation the patient was reported in good health.

Pathological Report.—Tumor somewhat egg-shaped, of grayish-yellow color and of firm consistence. The surface smooth, with the exception of one small, area which has strands of tissue with small, fatty masses adherent to them. The length of the mass is 3*cm* and its greatest circumference transversely is 6.5*cm*, weight 6.5*gm*.

At the end of the tumor there is a short pedicle of optic nerve and upon cutting the mass longitudinally, the optic nerve is found to extend somewhat excentrically through the tumor for some distance, but gradually becomes lost in the growth. Upon transverse section the growth is found to be surrounded by a definite capsule, which, upon microscopical examination, proved to be the attenuated dura.

The optic nerve has the appearance, in cross-section, of a white core, having a diameter which is somewhat greater than that of the normal nerve, while the bulk of the tumor is seen to be made up of the tissue interposed between the nerve and the dura. Microscopically, the neoplasm proper is found to consist of a reticulum of fibrous tissue which is infiltrated abundantly with nucleated cells. Upon examination of the

optic nerve, stained by Von Gieson's method, the pial septa were found greatly thickened so that the meshes of the interstitial tissue are practically obliterated in places; but in addition to this hyperplasia of the pial septa, a definite invasion of the nerve by dense, fibrous tissue, rich in nucleated cells, which in places entirely replaced the parenchyma of the nerve. This invasion of the optic nerve by new-formed tissue is not concentric and equally progressive from all parts of the periphery of the nerve, but is greater in some places than others, so that certain areas are quite free from this new-formed tissue. The pia itself is thickened and infiltrated with nucleated cells. The central vessels of the nerve have thickened walls.

The predominant element of the tumor is fibrous tissue; the growth evidently belongs to the connective-tissue group, and the cellularity warrants placing it in the class of sarcomata.

The neoplasm is then a primary intradural fibro-sarcoma of the optic nerve. The globe showed changes incident to a severe plastic irido-cyclitis only.

I am indebted to Dr. Geo. H. Knapp, for the painstaking and complete pathologic examinations of these cases.

THE CLINICAL COURSE OF CONJUNCTIVAL AFFECTIONS ASSOCIATED WITH SO-CALLED TRACHOMA BODIES.[1]

By Dr. MARTIN COHEN, New York.

AFTER a joint paper, published two and a half years ago by Dr. Noguchi and myself[2] on "The Relationship of the So-called Trachoma Bodies to Conjunctival Affections," I considered it important to keep under observation all the available cases on which depended our hypothesis that the trachoma bodies are the etiological factor of an independent conjunctival affection. All the cases in which the trachoma bodies were detected in conjunctival smears by Dr. Noguchi at varying intervals up to date can be grouped under the following three classes:

Types and Stages	Original No. of Cases	Number of Cases Resulting from Infection
I.—Trachoma		
a. Hypertrophic (with pannus)	3	7
b. Papillary (without pannus)	2	6
c. Follicular or granular	1	3
d. Atrophic or cicatricial	3	3
II.—Blennorrhœa Neonatorum Non-Gonorrhoica	6	2
III.—Blennorrhœa Gonorrhoica in Young Girls	6	20

[1] Read before the Ophthalmological Section of the Academy of Ophthalmology and Oto-Laryngology at Niagara Falls on August 21, 1912.

[2] Hideyo Noguchi and Martin Cohen: "The Relationship of the So-called Trachoma Bodies to Conjunctival Affections." *Archives of Ophthalmology*, 1911, xl., 1.

The object of this paper is to deal with the clinical course of those cases in which infection is believed to have originated from some one of the three types. The infections referred to in the tabulation occurred in asylums, hospitals, and families where the source of infection could usually be traced and its effects noted at definite intervals.

The clinical course was probably little influenced, if at all, by the mild therapeutic measures which were employed in most of the cases; in some of them no local treatment whatever was given.

The affections mentioned are usually communicated by fingers or articles coming in contact with the conjunctiva. Through observation of groups of cases I became convinced that some individuals escape infection, though subjected to the same exposure as those infected. In other cases there was a milder infection with a shorter duration of the disease.

I.—Not being directly concerned with the object of this paper, the clinical course of the various types of *trachoma* in which the bodies were present at varying intervals will be omitted. On the other hand, the clinical course of the disease will be described which was due to infection from cases of trachoma, this disease simulating trachoma for a time, but differing from it by a shorter and more acute course, and the absence of subsequent conjunctival cicatrization and pannus.

The disease, when communicated, is of a rather acute type, and in the twenty-four cases studied, the so-called trachoma bodies were present for periods varying from two to nine months. In some of the early cases observed, the entire conjunctiva was congested and swollen during the first week, showing slight mucoid secretion and medium-sized follicles in the upper and lower transitional folds. The follicles gradually increased in size and number for the following three weeks, hypertrophy with distinct papules appearing on the tarsal conjunctiva and giving it a sand-like appearance. This condition remained stationary in some cases for several weeks when the process retrograded. The follicles and papules on the upper conjunctiva became absorbed, the hypertrophy disappeared, the congestion diminished, and finally the lower conjunctiva, after exhibiting to a mild degree the sand-like appearance above referred to,

became restored to normal. The usual time required for this resumption of a normal appearance was three or four months, though in one case the time was nine months. In another case of the papillary type, ptosis and hypertrophy, with a papillary appearance of the conjunctiva of the upper and lower lids of one eye, still persist after a year and a half. Only mild therapeutic measures were employed except in those few cases showing no tendency to ameliorate. In two cases with acute manifestations, in which the bodies were present, the inflammation involved only one eye, but showed the same course as the bilateral cases just described. Partial ptosis of one eye was present in two cases which gradually disappeared after several months.

II.—The clinical course of *blennorrhœa neonatorum non-gonorrhoica* was as follows:

In the six cases studied, the bodies were found at periods varying from four days to two weeks after birth. The clinical course of these cases resembles that of mild cases of blennorrhœa gonorrhoica, which in its earliest stage is characterized by a diffuse conjunctival congestion with a mucoid secretion from the conjunctiva. This condition remains for about one week, when the conjunctiva assumes a fine papillary appearance, and a few small follicles are seen on the upper fold as well as on the lower. This appearance lasts about two months, when the process regresses simultaneously with the gradual disappearance of the bodies and is followed by a permanent return of the conjunctiva to normal in from three to four months. In one of these cases, the conjunctiva was more congested than in the other five, and a pseudo-membrane was present on both upper conjunctivæ. This patient was taken home after having been in the maternity ward for two weeks; when, three days later, the mother returned with the child, the condition in the child's eye was slightly improved, but in the mother the conjunctiva of one eye was slightly congested, with a few follicles present and a slight mucoid secretion. A conjunctival smear from the mother's affected eye revealed the presence of so-called trachoma bodies, and these were found at intervals for three months. One week after the original involvement of the mother's eye, her other eye—previously normal and free from bodies—became similarly affected. The clinical course

in this case was similar to those observed in the acute manifestations simulating trachoma. The total duration was six months; the cornea remained clear, and the conjunctiva became normal and has remained so up to date.

III.—*Blennorrhœa gonorrhoica in young girls.*—In an epidemic at the Randall's Island Hospital in July, 1910, there were thirty cases of this disease in girls from five to fifteen years of age, twenty of whom are still under observation. After six cases had developed, these and the successive cases were transferred to another ward, until within a few days thirty patients were isolated, all of whom had marked ophthalmia, as evidenced by intense œdema of the lids, pyorrhœa, diffuse congestion, and folding of the conjunctiva and, in a few cases, a necrotic membrane covering the tarsal conjunctiva. In six of the cases, vaginal smears taken at the outset showed the gonococcus, but no bodies. Conjunctival smears in all the cases showed both gonococci and so-called trachoma bodies, but the irregularity of their discovery and the inconstancy of their association were noteworthy. For four months smears were repeatedly taken at intervals of a few days; sometimes gonococci would be found alone, at other times so-called trachoma bodies alone, and occasionally both gonococci and bodies.

Toward the end of the illness the gonococci naturally were less numerous and frequent, but the bodies persisted even after a cure of the gonococcal infection had been practically effected.

One case constituted an exception to the above findings in that gonococci alone were found throughout the course of the disease, though clinically the case was similar to the others. The course of these cases resembles that of blennorrhœa gonorrhoica, as seen in adults, the hypertrophic and papillary stage of which is hardly to be distinguished from trachoma.

After regression from this stage of the disease, in most of the cases the conjunctiva became normal in from three to four months; in several, however, there is still, two and a half years after infection, a slight congestion of the lower conjunctiva and a few granules are present on the tarsal conjunctiva and folds, this persistence being possibly due to a mild reinfection.

Our further observations, as described in this paper, seem to confirm the hypothetical conclusion arrived at two and a

half years ago, that there exists an independent conjunctival affection associated with the trachoma bodies, this affection resembling trachoma with acute manifestations, but not complicated by pannus or cicatrices and their sequelæ. If the disease were trachoma, the usual sequelæ would have developed in at least some of the cases after two and a half years. The assumption that an attenuated trachoma virus might be responsible for this independent conjunctival affection, associated with the trachoma bodies, is hardly tenable, as under such circumstances the bodies should be demonstrable oftener in chronic trachoma than was really the case; for only in thirty-six out of the sixty cases studied, or 60%, were the trachoma bodies detected.

If trachoma can exist in such a mild form that its evolution to complete cure takes place without cicatrization, pannus, or other sequelæ, then our description of trachoma as considered by most ophthalmologists must be somewhat altered.

Blennorrhœa neonatorum non-gonorrhoica, with which the trachoma bodies were also associated, is not trachoma: (1) because in the new-born there is no opportunity for infection except through the genital tract of the mother; (2) because the condition bears no clinical resemblance to trachoma; and (3) because there is spontaneous cure without sequelæ, although in adults, infected from these cases, there are manifestations simulating the acute stage of trachoma, if there be such a stage.

As to blennorrhœa gonorrhoica in young girls, where the bodies were found in conjunction with gonococci, and in some cases of typical trachoma, these conditions are to be interpreted as the result of the disease caused by these bodies becoming engrafted on the original affections.

Finally, absolute proof of the hypothesis that the trachoma bodies are responsible for an independent conjunctival affection will not be forthcoming until a means shall have been discovered of growing these bodies in pure culture. Sufficient evidence has, however, already been adduced that the term "trachoma bodies" is a misnomer and should be discarded.

ON ACQUIRED RETRACTION MOVEMENTS OF THE EYES.

By Privat-Dozent Dr. ROBERT SALUS, 1st Assistant, German Eye Clinic, Prague.

Translated by Dr. Alfred Braun, New York.

THE retraction of the globe into the orbit, on contraction of one or more of the ocular muscles, is one of the rarest symptoms in the domain of the oculomotor apparatus. Heuck, in 1879, appears to have been the first to call attention to such retraction movements, in a case of bilateral congenital ptosis with almost complete immobility of the right eye. There followed many such observations by Stilling, MacLehose, Bahr, Türck, Wolff, and others.

In all of these cases, there was divergent squint, absence of abduction; sometimes adduction was wanting altogether, sometimes it was only limited, and often there was permanent enophthalmos.

The retraction movements always occurred upon attempting to move the eye in, and were, in some cases, combined with a deviation upward or downward.

Türck has given the following explanation for this form of retraction: It can be produced either by the insertion of one of the recti muscles very far back (in the above mentioned cases, the internus), or by fixation of the globe on the temporal side. In the first case, the muscle cannot unroll itself from the globe sufficiently to exercise its normal function, and in the latter case, the eye cannot follow the pull of the antagonistic muscle, and consequently it is pulled backward.

That both these theoretically deduced possibilities really occur, has been proven, partly through operation on such cases, and partly experimentally. Bahr found, in his case,

that the greater part of the rectus internus was inserted 12*mm* behind the corneal margin, and a second bundle was inserted still farther back. The rectus externus was entirely wanting. Heuck also was able to demonstrate on his patient a marked displacement backward of the insertion, of both the inner and outer recti.

Axenfeld and v. Schürenberg have indirectly given the same cause for their cases, in testing the passive movements of the eyes with forceps. This showed passive movement in the direction of adduction to occur without any resistance, and without retraction, from which we may draw the conclusion that there was no fixation of the globe on the opposite side.

The more common form of retraction seems to be that due to fixation of the globe of the temporal side. In such cases, the external rectus is replaced by a rigid fibrous band, with few or no muscular elements. Inouye was the first to demonstrate this anatomically. Zur Nedden showed in his case considerable resistance to passive adduction with the forceps. Passive abduction was free.

I had the opportunity of observing two similar cases, lately. Birch-Hirschfeld has recently given a collective exposition of the condition in the *Graefe-Saemisch Handbuch*.

This form of retraction, then, is not at all uncommon, *i. e.*, the congenital form, caused by a purely muscular anomaly, either a congenital aplasia of the external rectus, or a far posterior insertion of the internus, which then represents a persistent retractor bulbi.

Much less common are the acquired retraction movements which may be divided into four groups, according to their symptoms and etiology.

The first, comparatively common group, are those cases in which, as the result of inflammatory processes, or injuries of the muscles in the orbit, there occur cicatricial adhesions between them. Usually there is co-existent enophthalmos with restriction of mobility in various directions. This, together with the history, with possible traces of the injury on the skin or eye, or the results of the primary inflammatory process in the orbit, makes the etiology of such a retraction certain.

We saw, only recently, such a case, with marked enoph-

thalmos, and retraction accompanying adduction, which occurred after an acute traumatic orbital phlegmon.

Dippelt reported a case of retraction due to traumatism, in which, after the traumatism, as a result of cicatricial contracture and adhesion between the rectus internus and the sclera, with every attempt at adduction, the globe was drawn back into the orbit.

To the second group belong those cases in which psychic emotions cause reflex contractions of the ocular muscles, with short retraction movements.

In this group belongs a case of Förster's, before the introduction of cocaine, which was reported by Förster's son.

"A retraction of the globe into the orbit, as the result of irritation of the corneal nerves, I have often had the opportunity of observing, especially during removal of foreign bodies from the cornea with the needle or gouge, also during corneal incision for iridectomy or extraction. The retraction was momentary and spasmodic, and was about 2–3*mm* in extent. Whether the insertion of the lid-retractor had the same effect, I cannot recall. Since the introduction of cocaine, this observation is probably no longer made."

I am sure, however, that cocaine has little to do with the matter, for even now it is not so uncommon at the beginning of a globe operation for the eye, when it is grasped with the fixation forceps, to suddenly draw back into the orbit. This is undoubtedly due to the psychic emotion causing a powerful innervation of the ocular muscles, with a contraction, which, since the eye cannot move in any direction, on account of its fixation, manifests itself in a retraction of the eye.

In a third group, W. Förster's case may be included, although, strictly speaking, it does not really belong here, as the retraction movements are more passive than active. Förster's patient was a very thin, emaciated individual, with deep, sunken eyes. When the lower lid was drawn down, the lid, fornix, and remaining conjunctiva were drawn forward, resulting in a broad, almost horizontal, conjunctival surface, from the edge of the lid to the eye, the eye at the same time sinking back into the orbit. This phenomenon was even more marked when both upper and lower lids were drawn apart together. By drawing either upon the upper or lower lid, alone,

there occurred, with the enophthalmos, a slight turning of the eye, in the opposite direction. Under ordinary conditions, the movements of the globe were normal, but when enophthalmos was produced in the above-mentioned manner, the movements to the right, left, or downward lagged considerably behind those of the other eye, the movement upward being only slightly less. When the eye was grasped with forceps, however, the passive movements were free in every direction. Measured with Fick's tonometer, there was a difference of about 3*mm* between the positions of the normal and enophthalmic eyes.

The following is the explanation that the author gives for this phenomenon: Where there is so much loss of fat in the orbit, the globe occupies the empty space, by falling back into the orbit. The lids, by deep-drawn folds, replace the fat-cushion which ordinarily separates the globe from the anterior portions of the walls of the orbit. If, now, the lids are drawn apart, and at the same time outwards, the fasciæ which are attached to the lids follow this pull, whereas, with normal conditions in the orbit, this could not happen, as, with a normal position of the globe in the orbital entrance, the fascial attachments are completely relaxed. Through the tension on the fascial sheaths, however, the retrobulbar connective-tissue is also pulled forward, and the globe falls backward into the empty space which is thus formed.

In similarly emaciated individuals, neither Förster not Birch-Hirschfeld could make out this phenomenon, therefore it seems reasonable to suppose that in the above described case there must have been some peculiarity in the relations of the muscles, or the attachments of the fasciæ, in order to produce the retraction.

The last group of cases of acquired retraction movements differ from the preceding groups, in that the cause lies not in the muscular apparatus nor in abnormal conditions in the orbit, but in the central nervous system.

There has been no mention made in the literature of retraction movements as symptoms or accompaniments of a cerebral affection. Only two cases could I find in which this phenomenon could be assumed to be acquired, in all probability, and in connection with a central disorder. It

seems, therefore, to be a very rare condition, although it may possibly have been overlooked in some cases.

I would like to go over, in detail, the two cases reported by Koerber.

CASE 1.—The patient was a student, 21 years of age, whose trouble began about six years before, without any apparent cause. The vision in the left eye became poor, and the eye turned outward. This condition has increased, and, in addition, there has come a slight diminution in vision in the right eye. Since the last few years, there is diplopia. There is divergent strabismus on the left side, and the left palpebral aperture is somewhat smaller than the right. The diplopia indicates a paresis of the left internal rectus and superior oblique. Especially upon attempting to look upward, there are retraction movements of both eyes, with slight twitching of the orbicularis and alæ nasi, in some positions, nystagmus, symmetrical paresis of movement upward, and an indication of paralysis of movements to the right. There are levator paresis, loss of pupillary reflex to light, and weak reaction to convergence and closure of the lids.

The general examination showed only neurasthenia and increased knee-jerks.

Koerber is inclined to consider this, in view of the fact that in cats retraction movements of the globe, as well as loss of the pupillary reflex, can be produced by irritation of the medulla oblongata, "as most likely due to a chronic disease of the medulla or the region between the medulla and the corpora quadrigemina." However, in spite of the patient's statements to the contrary, one cannot help feeling that this is essentially a congenital anomaly.

The supposition of Koerber seems much more probable to me, namely, that the condition is due to a disseminate sclerosis or a chronic polioencephalitis superior.

CASE 2.—The second case reported by Koerber is that of a farmer 48 years of age, who, after recovering from an attack of influenza, had a diplopia, which lasted for two weeks, and then got well spontaneously. There was paresis of several branches of the third nerve, more marked on the right side than on the left, with especial involvement of the superior rectus. When the patient looked upwards, there were marked retraction movements of the eyes, more

marked on the left side than on the right. At the same time, there was a paresis of accommodation, more marked on the right side, and a slight paresis of the right sphincter.

The author believes the above mentioned pareses to be due to the influenza. The retraction movements are due to an abnormally increased innervation of the recti, which occurs when the patient attempts to innervate the markedly paretic elevator of the eye.

We see, therefore, that in both cases, there were multiple incomplete paralyses in both eyes, and that retraction usually occurred when there was an intended movement in the province of one of the markedly paretic muscles.

To these two cases I can add a third case, recently observed, which should put an end to all doubts as to the occurrence of such acquired retraction movements as an accompaniment of cerebral disease.

N. M., a miner, 25 years of age, was brought to me on June 3, 1908, in a somnolent condition. His brother, who accompanied him, stated that the patient was always healthy, as a child. In 1904, he joined the army, but after eight weeks he was released on account of his eyes. What the nature of this trouble was the brother did not know. After leaving the army, the patient worked in a coal mine, until October, 1906. At this time, his present illness began, with frequent attacks of vertigo, during which the patient sometimes fell on the street, always forward. In addition to this, the brother noticed that almost daily the lids of the left eye contracted for a few minutes (on closer questioning, it seems that the condition was one of ptosis). These attacks of vertigo have continued up to the present.

In February, 1908, the patient became sleepy, lay in bed a great deal, and was brought to hospital in B., where, apparently, a tapeworm treatment was undertaken. (A note sent to this hospital was not answered.) After four weeks he was discharged, his apathy continued, and it was noticed that it was necessary to speak to him in a very loud tone of voice, although his hearing was very good. After this, he spoke scarcely nothing, slept continually, and ate occasionally a roll and milk.

For the last nine months he complained of severe headache, mostly in the front and right side. Since 1904, frequent vomiting, severe and sudden, which has persisted up to the present. A moderate drinker. He had gonorrhœa in 1905. He denies lues.

June 3. *Neurological Findings* (Prof. Dr. Margulies).—On arising the patient sways to the right, and would have fallen had he not been supported. When he walks, being supported on both sides, he sways, first to the left, then to the front, and upon sitting down, again to the right. The patient sits almost continually, with his head bowed forward, almost at right angles. He reacts, scarcely at all, to questions, and must first be shaken out of his apathy. Sometimes he grasps his right temple, which he indicates to be painful.

Upon his entire body, he reacts to a pin-prick. His grasp is equal on both sides, and strong, but it is striking that it takes a considerable length of time until he attains his full strength. His coated tongue deviates to the right, the right labio-facialis is somewhat weaker than the left, both knee-jerks are increased, bilateral ankle-clonus. The character of the plantar reflex is undecided.

Pulse is 60–66, irregular. Pulse-wave flat. During the entire examination, the patient is very dull, and answers questions only now and then. His smell is normal.

Eye Examination.—The left palpebral fissure is about 1*mm* wider than the right. The left eye is somewhat exophthalmic, and its visual axis is somewhat lower than that of the right eye. Almost complete absence of winking. The eyeballs do not move. The usual position is a slight bilateral adduction. Upon attempting to look in any direction, there is an increase of this convergence, but without any pupillary change. At the same time there is a very marked retraction of both globes, in the form of spasmodic jerking movements, which is evident, not only in the eyes themselves, but also in the orbital fold of the lids. There is no orbicularis-contraction accompanying the retraction. There is no movement of the eyes in any other direction.

The eyes are normal, externally. The pupils are moderately dilated, and react promptly to light. Ophthalmoscopically, there is seen a high degree of choked disk, with a prominence of about 6 D., with apparently marked diminution of the visual acuity. (Fingers at 1 M.) Temperature 36.4° C.

June 5. Patient is much brighter to-day; gives connected answers, complains of his poor vision, and also that he is always sleepy. Facial expression is vacant, apathetic, and rigid. Cutaneous sensibility is intact over the entire body. Sense of position is normal. The motility of both extremities is equal, but the tongue deviates to the right, and the right labio-facialis is weaker than the left. To-day, there is marked ankle-clonus, right; on the left side, slight.

Babinski positive, right; uncertain, left. On walking, there is marked swaying to the right, also during rapid turning. The retraction is unchanged. Exophthalmos, measured with Hertel's exophthalmometer, 15*mm*, right, and 16*mm*, left. Left pupil is now somewhat wider; light reaction is good. V=0.7. Ophthalmoscopic picture is unchanged. There is diplopia, but the statements of the patient are of no value for determining its nature. Pulse 76; X-ray picture, negative.

The history raised the suspicion of the possibility of the presence of a cysticercus, in the region of the fourth ventricle. As this localization did not admit of a radical operation, there was performed by Dr. Rubritius, on the 8th of June, a palliative trepan operation in the left temporal region. A large skin and bone flap was made, exposing a very tense dura. The brain, in the exposed area, was normal. No tumor was palpable. Puncture of the ventricle gave a clear fluid, without pressure; resection of a portion of the bone in the anterior part of the flap; suture of the dura, reposition of the flap, and skin suture. After the operation, the choked disk was unchanged.

In the evening, the temperature was 37.2° C., pulse 80, choked disk unchanged, patient somnolent.

June 9. Patient reacts on being asked to show his tongue. But he is somnolent, and does not speak There is no aphasia. Highest temperature, 38°; pulse good.

June 11. Dressing. Wound is clean, skin flap is pale, slight œdema of the lid, no change in movements of the globe, retraction or choked disk.

June 12. Patient feels easier, and prays without hesitation the paternoster, and repeats difficult words.

June 12, Midnight. Sudden severe tonic and clonic spasms, during which the patient falls out of bed. Bandage is soaked with blood. Cheyne-Stokes breathing. Pulse about 80 and irregular. Bandage was changed. Small hematoma at the posterior edge of the wound. In the course of the night, the spasms were repeated about ten times. They begin with jerking of the thumb and index finger of the right hand, extending to the right platysma, the right sterno-mastoid and facialis, and then the entire right lower extremity, lasting one to two minutes. During the attack, the pupil is dilated and sluggish, the head bent to the right. The attacks are preceded by a short cessation of respiration. In view of the presence of the hematoma, intracranial bleeding was suspected, and the trephine wound was reopened. But everything was found normal. Temperature in the morning was 37°, pulse 140, stertorous breathing. Retraction and ophthalmoscopic findings un-

changed. The attacks become shorter and more frequent. Exitus at 2.15.

Post-mortem (Prof. Kretz).—U-shaped skin-bone flap in left temporal region. Region of the right orbit slightly suffused, left pupil widely dilated, right pupil moderately dilated. In subdural space, a small amount of fluid blood. The meninges, on the convexity, somewhat pale; in the region of the trephine area, adherent to the dura; and at the base, in the region of the chiasm, slightly cloudy. The convolutions are markedly flattened, the brain substance anæmic, soft, and, in the region of the left temporal lobe, very moist. Numerous hemorrhages in the gray matter. The ventricles are dilated, the left more than the right. The ependyma is slightly granular. There are about 50*cc* of clear fluid. On opening the fourth ventricle, there is seen a small, thin-walled vesicle, about 5 x 3*mm*, with one end in the aqueduct.

The fourth ventricle is somewhat dilated. Both tonsils are covered with pus, and the cervical glands are enlarged, reddened, and hemorrhagic.

Pathologic-anatomical Findings (Prof. Dr. Margulies).—On microscopic section there is seen, extending above the floor of the fourth ventricle, dorsally forward into the aqueduct of Sylvius, up to the anterior corpora quadrigemina, a cysticercus of typical structure and appearance. The greatest diameter of the vesicle is seen in sections which pass through the fourth ventricle, directly behind the aqueduct of Sylvius, becomes gradually narrower dorsally, but becomes rapidly narrower ventrally. In the region of greatest circumference, there are seen constrictions (daughter-vesicles). The cysticercus is elliptical in shape, and does not reach the walls or the floor of the ventricle anywhere, and is nowhere in contact with the brain-substance. In some places it seems to be adherent to the pia. The ependyma of the ventricle does not appear to be altered. The aqueduct is widened, but is nowhere completely filled by the cysticercus. The spinal cord below the cysticercus is normal. There were no noticeable changes in the region of the nuclei of the ocular muscles. The nerve-roots are also normal.

Choked disk is an almost constant feature of brain cysticercus. Yet the small size of the vesicle can scarcely cause sufficient increase of intracranial tension to cause this symptom. In this case there could not have been any tension, as puncture of the ventricle brought to light only a few drops of fluid. The cause of the papillitis, in these cases, is probably due to the production of large quantities of toxic materials by the cysticercus.

The disturbances of motility of the ocular muscles, on the other hand, were probably due to direct mechanical pressure on the nuclei, even though no marked anatomical lesions could be found.

If we now consider the retraction movements, we can be sure that they are acquired, for several reasons. In the first place, on account of the condition being bilateral, which is seldom the case in the congenital cases. Furthermore, in the post-mortem, no changes were found in the orbit to account for such disturbances of muscle function. The type of the retraction movements is also different from that seen in the congenital cases. In the latter cases, the retraction usually occurs during adduction, the eye being drawn horizontally inward and backward, whereas here there was a spasmodic series of jerking movements, directly backward, very aptly described by Koerber as "nystagmus-retractorius."

In order to explain this interesting phenomenon, we will recapitulate, briefly, the principal symptoms.

At the height of the disturbance, there was almost complete absence of all ocular movements. On attempting to look in any direction, there was marked retraction with slight adduction of both globes, without contraction of the pupil. There was absence of associated movements, as well as convergence; since, on attempting to converge, there occurred only a slight adduction of both eyes, without the contraction of the pupil which always accompanies convergence. The light-reaction of the pupils was normal.

The retraction movements can only be explained by assuming that the impulse of the will (innervation) to look in any direction flowed into all the ocular muscles, and, as a result of the predominance of the four recti over the obliqui, gave rise to retraction of the eyeballs. The adduction must not be considered to be due to a better innervation of the internal recti, but to the fact that with equal innervation of the four recti, on account of the physiological predominance of the action of the internus, there results a slight adduction.

The seat of the lesion was undoubtedly in the floor of the aqueduct of Sylvius.

In conclusion, I wish to thank my honored chief and teacher,

Prof. Dr. A. Elschnig, for his permission to publish the case, as well as for his constant interest.

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ON THE CHEMISTRY OF SENILE CATARACT

By Dr. ADOLF JESS, Assistant in the Eye Clinic, University of Würzburg.

Translated by Dr. Alfred Braun, New York.

RECENTLY, W. Reiss published some interesting findings in cataractous lenses, which he obtained with the aid of a new albumin reaction. This is a red coloration, resulting from the use of sodium-nitro-prusside and ammonia, which was first observed by Heffter with egg-albumin, and could not be obtained with serum-albumin, fibrin, egg-globulin, keratin, or peptone.

Independently of Heffter, Arnold later tested a large number of albuminous bodies with this reaction, and found it to be positive in a series of animal as well as plant albumins. The proteid substance of most of the organs (liver, thymus, muscle) reacted positively, whereas connective tissue (tendons, fascia, cartilage) and the albumin contained in the excretions and secretions (mucin of the saliva, casein of the milk, the albumin of urine) did not give the reaction. The reaction was less strongly marked in the albumin of various plants, and was most strongly marked in the lens of the eye.

Arnold as well as Heffter considers the red coloration to be due to the presence of the cystein group in the albumin molecule, for of all the amino-acids in albumin, cystein alone becomes red with sodium-nitro-prusside and ammonia.

Reiss was able to prove that in the normal lens there was no difference in the behavior of the peripheral and of the central layers with the cystein reaction. In senile cataract the reaction disappears entirely or in part, whereas a traumatic cataract behaves like a normal lens. The red coloration was entirely wanting in hypermature cataract. In mature

cataract, it was absent or present only as the faintest trace in the nucleus, and a trifle more marked in the cortex. In immature cataract, the cortex almost always reacts plainly, and in some cases even the nucleus. The age of the patient had no bearing on the reaction.

I went over Reiss's results, and found them correct. In normal lenses, the reaction was always the same in the nucleus and cortex. I followed the same technique as Reiss, who separated the cortex from the nucleus, and examined each for cystein, rubbing up some of the lens matter on tissue paper with a spatula, and pouring upon this layer a few drops of a 4% sodium-nitro-prusside solution, and then a few drops of ammonia, upon which there resulted an intense red coloration when the reaction was positive.

In five cases of ripe senile cataract examined by me, the nucleus was entirely negative, while the cortex showed a faint pink coloration. In ten cases of immature cataract, the result varied with the stage of the ripeness, there being always a decided difference in the reaction between the more or less opaque nucleus and the clearer cortex. A traumatic cataract showed the reaction with equal intensity in every part of the lens substance.

Whether the three varieties of senile cataract (subcapsular, supra- and intra-nuclear) will show variations in the reaction, will be shown by further investigations. Reiss, in his 60 cataracts, did not specify the variety of senile cataract.

In two non-cataractous, but highly sclerotic and yellowish-brown discolored senile lenses, the reaction was just as strong in the central as in the peripheral portions. I found the same result in an amber-yellow senile cow-lens. The loss of the reaction cannot, therefore, be due to the normal sclerotic change in the nucleus of the lens. It must be due to the cataractous change in the lens-substance.

What this change is, Reiss thinks to be a loss of the cystein group. Whether this loss of the cystein reaction is due to a loss of the cystein group in the albuminous bodies of the diseased lens, or whether it is due to a general diminution of the albuminous content of the cataract (Cahn), or the almost complete absence of albumin in the nucleus (Michel), or to

degenerative fatty changes in the lens-fibres (Toufesco), cannot be said with certainty.

In analogy with the negative result of the reaction in a fatty degenerated liver, in which organ many cystein groups are normally present, Reiss accepts the last mentioned of the above possibilities, namely, that a fatty degeneration of the lens-fibres prevents the reaction in senile cataract.

Arnold, whose investigations Reiss followed, says, in his first work, in mentioning the color-reaction for the lenticular albumin, that he could find no portion of the lens, which is insoluble in water, and Reiss touches on this question when he mentions, parenthetically: "Arnold could not convince himself of the existence of an albumin insoluble in water or neutral salt solution, in the lens."

This is in contradiction to the statement of Mörner, whose work, " The Protein Substances in the Refractive Media of the Eye," 1893, has received universal recognition up to the present. Mörner distinguishes in the lens an albumoid insoluble in water (48% of the total albumin), two soluble globulins, α-Kristallin and β-Kristallin (19.5% and 32%), and a soluble albumin of which there is only 0.5% present.

Mörner mentions the case of the erroneous assumption of the non-existence of the insoluble albumoid, saying: "Ordinarily, in studying the albumins of the lens, the following method has been followed. The lens, rubbed up with sand, was mixed with water or salt solution, and after filtration all the attention was given to examining the filtrate. The residue, however, was never examined. Yet only half the lens substance is dissolved in the water. The only authors who mention an insoluble portion of the lens are Berzelius and Béchamp."

I was also able to confirm Mörner's statement of the presence of a considerable portion of insoluble albumin in the lens.

In the chemical examination, which was undertaken in the physiological institute, I received considerable help from Privatdozent Dr. Ackermann, whom I wish to take this opportunity of thanking. On his advice, I followed Mörner's directions very closely, analyzing the four albuminous bodies which occur in the lens.

In all, 120 cows' lenses were examined. After removing

the capsule, I rubbed them with fine sea-sand and water into a homogeneous paste, to which I added water gradually, allowed a sediment to settle, and centrifuged, thus removing Mörner's albumoid. This was mixed with water several times, and centrifuged. Whereas, at first, the nitro-prusside-ammonia reaction was present in trace, it disappeared entirely after the repeated washings.

It is therefore determined, that the albumoid of the cow's lens does not give the nitro-prusside reaction.

In the solution which was left after centrifuging away the albumoid, were contained the remaining albumins. In order to obtain the α-Kristallin, I filtered the fluid through very fine gravel, which removed the remainder of the albumoid, and precipitated the filtrate carefully with 0.1% acetic acid, until there was no more precipitation. This precipitate of α-Kristallin was isolated by means of the centrifuge, and gave a slight but distinct nitro-prusside reaction. The α-Kristallin was carefully cleaned by dissolving it in 0.05% ammonia and reprecipitating with 0.01% acetic acid, centrifuging, and the process again repeated. But in spite of this thorough washing there was still a distinct reaction. The reaction with α-Kristallin is not nearly so marked as with normal lens substance.

To isolate the β-Kristallin, I precipitated a portion of the remaining fluid with alcohol, which was filtered off, and washed with water and alcohol. This precipitate gave an intense purplish red reaction with the sodium-nitro-prusside and ammonia. As this precipitate consists, according to Mörner, almost entirely of β-Kristallin, there being at the most 2% of albumin present, the marked positive reaction is unquestionably due to the β-Kristallin.

In order to settle all question of doubt, I took another portion of the solution which was freed from the albumoid and α-Kristallin, and obtained the α-Kristallin free from albumin, by saturating with magnesium-sulphate, and repeatedly washing the precipitate with saturated magnesium-sulphate solution. There still remained the strong positive nitro-prusside reaction.

I was able to confirm the statement of Arnold, that the albumin-free extract of the lens gives the reaction, thus

proving it to contain free cystein. The reaction was positive in a dialysate of lens paste, as well as in the filtrate obtained after precipitating with ammonium-sulphate, this precipitate containing all the lens albumins.

The intensity of the coloration can be increased by adding saturated ammonium-sulphate solution, as well as concentrated magnesium- and sodium-sulphate solutions.

The most interesting point in the entire examination, and for the understanding of senile cataract perhaps the most important, is the complete absence of the nitro-prusside reaction in that albuminous body which is insoluble in water, and constitutes about one half of the entire albumin-content of the nornal lens.

It may seem peculiar that the β-Kristallin gives the reaction so much more strongly than α-Kristallin, yet this might be explained by the greater sulphur-content of the former. According to Mörner, the former contains 1.27%, and the latter only 0.57%. Besides this, the quantity of loosely combined sulphur in β-Kristallin is supposed to be very high. The sulphur-content of albumin is found entirely, or very largely, in the cystins and cysteins in the albumin-molecule. The β-Kristallin in the cows' lenses examined by me gave the sulphur reaction much more intensely than the α-Kristallin.

In order to obviate the danger of transferring conclusions from one class of animals to the human lens, I performed the same tests on human lenses. Thirty-six normal human lenses were tested in this way. The same results were obtained here.

It remains, then, to bring into harmony the fact of the failure of the reaction in intranuclear senile cataract and in the insoluble albumin (albumoid) of the normal lens. In this connection, older examinations in regard to the chemistry of the cataractous lens are valuable.

In agreement with other authors, Michel and Wagner found the amount of soluble albumin in senile cataract to be diminished. As it is just these forms of albumin, namely, α-Kristallin and especially β-Kristallin, which give the reaction, and the insoluble albumoid does not give it, the negative result of the nitro-prusside-ammonia reaction in senile cataract is explained very simply by the more or less complete loss of the soluble albuminous material.

Whether there is, here, an increase in the transformation of the Kristallins into the insoluble albumoid, which, according to Mörner occurs physiologically to a certain degree through life, this will be the subject of further quantitative investigations of the albumoid-content of the normal and the senile cataractous lens.

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HEMIANOPIC PUPILLARY PARALYSIS AND THE HEMIOPIC PRISM PHENOMENON.

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Abridged Translation from Vol. LXXXI., No. 1, German Edition of these Archives, by Dr. Percy Fridenberg, New York.

WHILE the exact course of the pupillary reflex fibres is still undetermined we may assume that centripetal pupillary fibres do not go beyond the primary optic ganglia; while Bechterew's theory of their decussation directly behind the chiasm into the gray matter on the floor of the third ventricle can no longer be maintained. The pupillary paths certainly traverse the great part of the optic tract and possibly continue on, as Bernheimer's fibres, into the external geniculate body.

The presence of hemianopic pupillary rigidity or hemiopic reaction, which may well be termed hemikinesis (Hess), is of prime importance in the localization of a lesion along the visual paths. Opinions are divided as to the possibility of exactly determining pupillary hemikinesis. Hess noted that not only the light reflected into the interior of the eye but dia-scleral rays as well could cause contraction of the pupil, and being unable to exclude these sources of error, eliminated them by making them constant by means of a simple apparatus and alternate illumination. His conclusion was that the hemianopic pupillary reaction is of no practical importance although it can, theoretically, be elicited. Wilbrand's prism-phenomenon, first suggested in 1899, consists in a compensating movement of the eye when the image of a fixed object is thrown on the blind half of the retina. This was noted in a number of cases which were proven on autopsy to be due to a lesion in the occipital lobe with primary optic centres, oculomotor nuclei,

and paths from globe to primary centres intact, and was lacking in a case of hemianopsia which clinically appeared due to basal luetic meningitis and was accompanied by incipient unilateral optic neuritis and oculomotor disturbances.

Wilbrand describes his procedure as follows: The patient is seated before a blackboard in order to concentrate his attention on a small patch of white paper; the second eye being occluded. A strong abducting prism is now brought suddenly in front of the eye so that the patient no longer sees the object he was fixing. We then note whether the eye makes a compensating motion in the axis of the prism, and whether this motion is reversed when the prism is withdrawn. The prism is to be presented suddenly so that the patient shall not be inclined to follow, consciously, the path of the image on its way from the fovea to the dividing line of the hemianopsia.

Wilbrand explains this reaction by habit which enables the individual to execute exactly the number of eye-movements which are required to move the fovea over the shortest path which will bring it again in contact with the displaced image. The motion has become automatic, almost reflex, although originally, perhaps, under control of conscious will. Wilbrand thinks this phenomenon requires further clinical and anatomical corroboration. Behr (1909) considers this prism test much more exact than the hemiopic pupillary reaction. Behr locates the afferent branch of the postulated reflex-arc in Bernheimer's fibres, which he thinks have about the same course as the pupillary fibres and so concludes that a negative prism reaction requires the presence of hemianopic pupillary rigidity. Behr had a positive reaction in five cases of hemianopsia of evidently intracerebral origin, and negative reaction in all four cases of lesions of tract and chiasm with complete break. Bielschowsky cannot admit any direct transmission of retinal stimulation to the oculomotor apparatus in the absence of light perception. He reports a case of chiasm lesion with amaurosis and optic atrophy in the left, and temporal hemianopsia of the right eye, in which there was prompt abduction on presentation of a prism of 40°, base in. The intelligent patient herself explained that she had learned to look to the right for objects which had disappeared from her field of vision, and B. agrees that the eye motion was the

result of experience gathered during the disease. If Behr's premise were correct we should be able to elicit eye motions at will by corresponding retinal irritation in every case of cortical blindness, but this has never been clearly demonstrated. Recently Bielschowsky applied the test repeatedly with invariably negative results in a case in which autopsy confirmed the diagnosis of lesion in both occipital lobes with total blindness and normal pupillary reaction. Krusius reports four negative cases, one of bitemporal hemianopsia with probable hemianopic pupil, due to tumor of the hypophysis, and three of cortical hemianopsia with intact pupillary reaction. Koellner's nine cases of hemianopsia were negative, but the localization was not confirmed by autopsy.[1]

Some years ago Hess suggested the method of alternate illumination, mentioned above. Two lighted surfaces are alternately uncovered so that first the blind and then the seeing half of the retina is exposed while the total amount of light reaching the eye is hardly altered. This eliminates all inaccuracies due to diffused light. The lighted surfaces are first made "iso-kinetic" for a normal eye by so adjusting the illumination that the pupils remain of the same size with alternate illumination or contract to the same degree when exposed to either light. This must be tested separately for each eye, as Hess has shown that the motor excitability of the retina diminishes more rapidly toward the temporal side, and we have also to allow for variation in the quantity of light reflected from surrounding objects, parts of the face, and so on. The observation of the illuminated eye was made at 30*cm* distance with a telescope magnifying six times. The other eye was covered, so that the direct reaction was tested, not the consensual reaction as in Krusius's cases. In applying the prism test, monocular and binocular examinations were made with prisms varying from 16° to 32°. The test was also reversed; the fixed point being first deflected to the seeing

[1] Schwarz advised, as a modification of Wilbrand's procedure, to leave the other eye uncovered and to see whether it made any fusion motion when the image of the fixed object was deflected to the blind half of the retina. To this Behr objects that, as only weak prisms can be used in eliciting attempts at fusion, we shall be misled by an unavoidable source of error, viz., the macular preservation.

half of the retina, causing the patient to make a compensating eye-motion for macular fixation. The prism was then quickly withdrawn, causing the image to fall on a blind part of the retina and any "reflex" compensatory fixation noted. By testing in the dark room with two small light sources whose rays entered the eye at angles corresponding to the test with the prism, it was possible to eliminate the inhere ntsource of error attributed to a wandering of the displaced image over the macular reserve as a source of compensating motions, although, as a matter of fact, deflection of a ray by prisms does not cause any apparent motion of the image.

Eight cases from the Wuerzburg clinic are grouped in the following table:

No.	Lesion.	Visual Field.	Clinical Symptoms.	Hemikinesis	Prism Test
1	Sagittal tear completely through chiasm.	Bitemporal hemianopsia with preservation of macula.	Incipient atrophy. R. and L. complicated fracture of base. Diabetes insipid.	Positive.	Negative.
2	Tract lesion (left). Autopsy.	Right homonymous hemianopsia with macular preservation.	Choked disk, R. and L. R. hemiparesis involving R. facial, hypoglossus, and R. trigeminus.	Positive.	Negative.
3	Lesion of L. Optic radiation (occipital tumor). Autopsy.	R. homonymous hemianopsia. Macular preservation.	R. and L. choked disk, in later stage. Optic aphasia. R. paresis of extremities.	Negative.	Negative.
4	Hemorrhage into L. posterior capsule.	R. homonymous hemianopsia. Macular preservation.	Old lues. Apoplectic attack. Paresis of extremities, R.	Negative.	Negative.
5	Embolism central from corp. geniculat.	L. homonymous hemianopsia. Macular preservation.	Cardiac hypertrophy. Contracted kidney. Bilateral hemianopsia, at first.	Negative.	Negative.
6	Embolism central from corp. geniculat.	L. homonymous hemianopsia. Macular preservation.	Photopsies defective halves of retina, at commencement.	Negative.	Negative.
7	Hemorrhage in central course of visual paths.	R. (incomplete) hemianopsia. Macular preservation.	Apoplectic attack. Babinski (R).	Negative.	Negative.
	Porencephalic focus in optic radiation.	R. homonymous hemianopsia. Macular preservation.	Hysteria(?).	Negative.	Negative.

The lessons of these eight case histories may be briefly stated. The first three cases are classical, paradigmatic, for each of the three possible forms of hemianopsia. The lesion was proven to be present in the chiasm, in the tract, and in the occipital lobe, respectively. The findings in these cases can properly be used and the experience applied to the interpretation of symptoms and the localization of lesions in the other cases associated with hemianopsia which were not examined post mortem.

While hemikinesis could be determined beyond a doubt in both cases of lesion of the chiasm and tract, there was no pupillary disturbance of any sort in cases of central lesion.

The five next cases are to be considered as central hemianopsias. In cases 4 and 5, physical examination gave ample support for this diagnosis, while the assumption is justified in all of the cases by the finding of a normal pupillary reaction.

If there were a reflex-arc for involuntary eye-movements analogous to that for the pupillary fibres, as Behr assumes, there would infallibly have been reflex compensatory movements, positive prism test, in every one of the last six cases. The compensation was missing, however, in these cases, as well as in the first two with peripheral lesions. Where any sort of correction or fixation movement could be elicited it was at once seen that the rapidity and accuracy which gave the semblance of reflex movement depended on the intelligence of the patient and on the frequency with which the test was repeated.

Clinical observation confirms the inferences drawn from an analysis of the postulates of the prism phenomenon: Wilbrand's test cannot be used for the topical diagnosis of a hemianopsia.

The reverse is true of the hemianopic pupillary reaction. The presence or absence of this reaction, hemikinesis, disputed by many, and admitted theoretically while denied all practical value by others, must, as determined by the Hess apparatus, be considered in the light of the investigation herewith submitted as a sure diagnostic aid in the localization of cerebral affections.

REPORT OF THE TRANSACTIONS OF THE SECTION OF OPHTHALMOLOGY OF THE ROYAL SOCIETY OF MEDICINE.

By Mr. C. DEVEREUX MARSHALL, London.

The first clinical meeting of the Section was held on Wednesday, Nov. 6th, under the Presidency of Sir ANDERSON CRITCHETT, C.V.O.

Mr. HERBERT FISHER showed a case of **subhyaloid hemorrhage,** with drawing. He urged the abandonment of the term "subhyaloid hemorrhage," as the hemorrhage was intraretinal; he suggested the words "semilunar retinal hemorrhages." The President agreed with the suggestion.

Mr. A. W. ORMOND showed a case of **pemphigus of the conjunctiva,** followed by essential shrinking. The patient was æt. 24, and as his general condition as well as his sight were now so bad, he pleaded for something to be done. Mr. Ormond proposed to clear away the conjunctiva as much as possible and substitute mucous membrane from elsewhere. Mr. FISHER referred to a case of **pemphigus of the conjunctiva,** which was later under Mr. LAWFORD's care, in which a vaccine made from the contents of the patient's own vesicles was administered for some time, but without marked benefit. Mr. LAWFORD confirmed the fact that there was no definite improvement after the vaccine treatment. Mr. BISHOP HARMAN described a very severe and extensive case, involving larynx, pharynx, mouth, and both eyes, in which no treatment benefited.

Mr. R. GREEVES showed a case of **paralysis of the third nerve with periodic spasm of iridociliary muscles.** He said he could not make out any relationship between the movements of the two eyes. He thought the right pupil

was a little unsteady, but it seemed to have nothing to do with the contractions and dilatations of the other eye. Mr. HERBERT described a somewhat similar case, and suggested an explanation, namely, that a portion of the nucleus of the third nerve was non-existent and the other portion of it was weak, so that it was able to overcome the innervation of the higher centers only after an interval of rest.

Mr. HERBERT PARSONS showed a case of **Mooren's ulcer, with ulceration of the sclerotic,** and Mr. LESLIE PATON demonstrated **a modification of Herbert's operation for chronic glaucoma,** in which his object had been, while retaining the simplicity of Herbert's operation, to procure a more permanent result. Mr. HERBERT described his own attempts in the same direction, emphasizing the importance of not reducing the nutrition of the flap too much. The difficulty arose chiefly in subjects who had very shallow anterior chambers.

Mr. E. NETTLESHIP read notes of a case in which a **sarcoma of the choroid** was seen as a small spot of disease, but its true nature not recognized, about 20 years before the diagnosis of tumor was made, and 25 years before the removal of the eye. The case showed the importance of watching over long periods, when possible, the behavior of certain solitary spots or patches of dusky discoloration that were occasionally seen in the choroid during ophthalmoscopic examination, some of them probably being the beginnings of malignant growth, although others were, no doubt, congenital and stationary. Such solitary, non-inflammatory patches might sometimes be the counterparts of the minute sarcomatous growths, of which nine or ten examples had been accidentally discovered after death and published during the last few years.

Mr. NETTLESHIP read also a joint communication by himself and Mr. A. HUGH THOMPSON on an extensive pedigree of **Leber's disease of the optic nerves,** which illustrated the occurrence of the malady in females, recovery in some cases in both sexes, descent to all the children of one of the affected women, diabetes with blindness of unknown nature in one member, high infantile mortality in the very large family of one affected man, and absence of influence of the optic nerve disease upon prospect of life.

The President paid a tribute to the labors of Mr. Nettle-

ship in the domain of hereditary disease, and referred to the changes of medical opinion on the subject of heredity. Mr. HUGH THOMPSON supplemented the paper in respect to one patient, who was a heavy smoker, and suggested that in cases of tardy recovery from tobacco amblyopia enquiry should be made as to any connection with Leber's disease.

Mr. A. W. ORMOND read a paper on a **case of retino-choroiditis juxta-papillaris.** The patient was a man æt. 20, who found, on awakening, that he could not see very well with his right eye. He had had a little pain in the eye a week previously. On examination there were found keratitis punctata, and a patch of acute choroiditis touching the upper margin of the optic disk, and spreading upwards. Œdema of the retina spread over and beyond the patch. Vessels which passed over the inflamed area were partly obscured, and the arteries diminished in size; there was also some haze in the vitreous. Von Pirquet's reaction was positive. The inflammation gradually subsided, and the patient now had full visual acuteness, but a large sector of his field of vision, stretching from the blind spot to the extreme periphery, was entirely absent, and he had no perception of light in this area. The defective area in the field of vision was clearly due to the obliteration of a branch of the central retinal artery by the pressure of the inflammatory swelling. Under the title "Retino-choroiditis juxta-papillaris" Professor Jensen, of Copenhagen, published four similar cases in *von Graefe's Archiv*, in 1909.

QUARTERLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY

By H. KÖLLNER, Berlin; W. KRAUSS, Marburg; R. KÜMMEL, Erlangen; W. LOEHLEIN, Greifswald; H. MEYER, Brandenburg; W. NICOLAI, Berlin; H. PAGENSTECHER, Strassburg; K. WESSELY, Würzburg; and M. WOLFRUM, Leipsic, with the Assistance of ALLING, New Haven; CALDERARO, Rome; CAUSÉ, Mainz; DANIS, Brussels; GILBERT, Munich; GRÖNHOLM, Helsingfors; v. POPPEN, St. Petersburg; TREUTLER, Dresden; and VISSER, Amsterdam.

FIRST QUARTER, 1912.

Edited by Dr. MATTHIAS LANCKTON FOSTER, New Rochelle.

I.—GENERAL OPHTHALMIC LITERATURE. Reviewed by WESSELY.

(Books, Monographs, and Historical Essays.)

1. EVERSBUSCH. **The eye diseases of childhood.** Leipsic, 1912.
2. SALZER. **The diagnosis and the errors in diagnosis of diseases of the brain from the papilla nervi optici.** Lehmann, Munich.
3. WECHSELMANN. **Treatment of syphilis with "606."** Vol. ii., Berlin.

EVERSBUSCH'S (1, **The eye diseases of childhood**) book forms a part of Pfaundler and Schlossmann's large work on children's diseases, and although it is primarily intended for the general practitioner and pediatrist, it is almost a complete text-book on ophthalmology, in which is recorded the author's personal experience as well as his own opinion concerning all important therapeutic questions; it may be read with great interest by ophthalmologists. He begins with a description of the congenital abnormalities, together with an account of the anatomical and physiological development of the eye of the child, and then deals with the diseases of the different parts of the eye. The work is richly illustrated.

SALZER (2, **The diagnosis and the errors in diagnosis** of

diseases of the brain from the papilla) describes in a little appendix to Weygandt's *Atlas of Psychiatry* the physiological varieties of the papilla which have to be taken into account and cause difficulties in the differential diagnosis of commencing atrophy, or of commencing choked disk. Although not much that is new is presented, the article tends to make clear the limits within which a diagnosis can be made with the ophthalmoscope alone without the aid of an accurate functional examination. Two plates illustrate the most important types of physiological variations and congenital anomalies, together with the doubtful and certainly pathological conditions of the papilla.

The portion of this book which is of special interest to ophthalmologists is that which deals with recurrence in the nervous system, which WECHSELMANN (3, **Treatment of syphilis with "606"**) saw in only about ½% of the cases. He is not inclined to blame salvarsan for this, because it is slow in development and is curable by renewed injections of the preparation. He speaks of the diseases of the optic nerve that appear before the outbreak of the secondary symptoms, and of the treatment of tabes and paralysis. In the former the results were uniformly negative; in the latter he often saw such improvement, both subjective and objective, that he treats every patient with tabes with salvarsan, but very carefully so as to avoid any reaction, using small doses, 0.1 to 0.3 either subcutaneously or intravenously.

II.—RELATIONS OF OPHTHALMIC TO GENERAL DISEASES, INCLUDING POISONS. Reviewed by WESSELY.

4. BERNHEIMER. **Indicanuria and diseases of the eye.** *Wiener klin. Wochenschrift*, No. 11, p. 410.

5. STUELP. **Is indicanuria a frequent cause of diseases of the eye?** *Arch. f. Ophthalmologie*, lxxx., 3.

6. v. HIPPEL, E. **Indicanuria in diseases of the eye.** *Ibid.*, lxxxi., 1.

7. HIRSCHBERG. **Methyl-alcohol poisoning.** *Berl. klin. Wochenschrift*, No. 6, p. 247.

8. MENDEL. **Visual disturbances caused by methyl alcohol.** *Zentralbl. f. Augenheilkunde*, p. 43.

9. OHLEMANN. **Methyl alcohol.** *Wochenschr. f. Therapie u. Hygiene d. Auges*, Nos. 16 and 19.

10. VALUDE. **Ocular and auditory troubles following the use of hectine.** *Annales d'oculistique*, cxlvi., p. 272.

11. IGERSHEIMER. **Injuries of the eye by chrysarobin.** *Muenchener med. Wochenschrift*, p. 728.

12. PEARCE, F. H., RANKINE, R., and ORMOND, A. W. **Notes on 28 cases of Mongolian imbeciles; with special reference to their ocular conditions.** *British Medical Journal*, 1910, vol. ii.

13. GROVES, E. W. H., and JOLL, CECIL. **Thyreoid grafting and the surgical treatment of exophthalmic goitre.** *Ibid.*, vol. ii., p. 1965.

14. KOELLNER. **Hereditarily syphilitic fundus in a family of seven children.** *Med. Klinik*, p. 422.

15. AUBINEAU and CIVEL. **Palpebral tumor and paralysis of the sixth nerve in Recklinghausen's disease.** *Arch. d' ophtalm.*, xxxi., p. 808.

16. SALUS. **Erythema exudativum multiforme in the eye.** *Klin. Monatsbl. f. Augenheilkunde*, Jan.

17. CUPERUS. **A case of erythromelalgia and disease of the eye.** *Nederl. Tydschrift voor Geneeskunde*, vol. i., p. 5.

18. LAGRANGE. **A Case of uræmic amaurosis in a pregnant woman.** *Archives d'ophtalmologie*, xxxi., p. 675.

Autointoxication as the cause of diseases of the eye occupies to-day the forefront of interest. Since E. v. Hippel opposed Elschnig's view that autointoxication plays a part in the development of sympathetic ophthalmia, as well as of chronic iridocyclitis, of which indicanuria is a symptom, several articles have appeared on the subject.

BERNHEIMER (4, **Indicanuria and diseases of the eye**) has made accurate observations concerning the indican in the urine of 308 stationary cases and obtained 31 positive results. But these are divided almost uniformly over the most various diseases of the eye, and the ratio scarcely exceeds 10%, either in retrobulbar neuritis (47 cases with 5 positive results) or in iridocyclitis (34 cases with 5 positive). Bernheimer therefore, agrees with v. Hippel that indicanuria is not of importance in diseases of the eye, and also that it is not generally pathognomonic of intestinal intoxication.

STUELP (5, **Is indicanuria a frequent cause of diseases of the eye?**) comes to almost the same result. In 1000 cases of diseases of the eye, including both such as were thought by Elschnig to be frequently caused by autointoxication and others, in which no such connection has been claimed, he found an abnormally high amount of indican in the urine in about 8% of the cases divided quite uniformly through all the groups of disease. The same percentage was obtained from an examination of 50 patients who had no eye disease. Quite

independently therefore of the question whether indicanuria is or is not pathognomonic of the presence of autointoxication he cannot find it of importance in the etiology of diseases of the eye.

In the same way E. v. HIPPEL (6, **Indicanuria in diseases of the eye**) found indicanuria in only 16 out of 416 cases, less than 4%, and these uniformly divided among the most various diseases of the eye.

Several articles deal with the cases of methyl-alcohol poisoning in Berlin. HIRSCHBERG (7, **Methyl-alcohol poisoning**) gives a historical account of our knowledge of blindness following the drinking of methyl alcohol, which reaches back seventy years, during which time individual cases were reported. Many cases due to the adulteration of liquor with methyl alcohol were observed in America and Hungary until finally sufficient material accumulated in literature so that now this is the form of poisoning to be suspected in cases characterized by vomiting, pain in the stomach and head, deafness, widely dilated pupils, the onset of total blindness, and, in the worst cases, of death.

MENDEL (8, **Visual disturbances caused by methyl-alcohol poisoning**) says that of 130 patients who entered one of the hospitals in Berlin suffering from methyl-alcohol poisoning 58 died, subsequently to becoming totally blind. In these cases the pupils were widely dilated and without reaction, the retinal vessels were greatly engorged, in some optic neuritis and choked disk were present. In the patients who survived and complained at first of visual trouble, the vision gradually returned. In these cases also the retinal vessels were engorged, while in some the pupils were immobile, and in others reacted slowly. In four patients a high degree of amblyopia or amaurosis persisted together with atrophy of the optic nerve.

OHLEMANN (9, **Methyl alcohol**) believes that the most certain point of differential diagnosis between botulismus and methyl-alcohol poisoning is the loss of consciousness in the latter.

VALUDE (10, **Ocular and auditory troubles following the use of hectine**) reports the case of a tabetic who was treated for the second time with ol. ciner. on account of an oculomotor paresis and had received a year previously 10 injections of 10

or 20*cgr*. of hectine. At that time only transient visual troubles were caused. The renewed treatment resulted in total loss of the peripheral visual field and of the hearing. The latter was regained somewhat, but the former went on to total blindness. It was not until after six months that a commencing atrophy of the optic nerve could be made out ophthalmoscopically. Valude warns against the use of this remedy in patients who already suffer from troubles with the optic or auditory nerves.

CAUSÉ.

IGERSHEIMER (11, **Injuries of the eye by chrysarobin**) remarks the phtophobia in cases of chrysarobin conjunctivitis, and finds that there is always an involvement of the cornea in the form of superficial punctate opacities. This chrysarobin keratitis usually recovers in a few days. He thinks the origin is partly ectogenic, partly from the remedy absorbed into the skin.

A large number of defects were noted by PEARCE, RANKINE, and ORMOND (12, **Notes on 28 cases of Mongolian imbeciles**) such as squint and nystagmus, but especially a particular form of cataract. This consisted of small dots in the cortex nearer the anterior than the posterior surface, to be seen only by focal light. In the more marked cases the opacity consisted of two layers enclosing a clear nucleus, the posterior being concave forwards, the anterior flat and situated about midway between the center of the nucleus and the anterior lens surface. A star-shaped opacity was seen at the posterior pole of the cataract and sometimes at the anterior pole. Some may therefore be termed lamellar and others congenital "dot" cataracts. There is no evidence at present as to whether the condition is stationary or progressive. A. H. PAYAN DAWNAY.

GROVES AND JOLL (13, **Thyreoid grafting and the surgical treatment of exophthalmic goitre**) record a case of Graves's disease of twelve months' duration in which the symptoms were relieved for only ten days by removal of the right lobe and isthmus. Six months later the patient a girl, 19 years old, had a small piece of thyreoid with two parathyreoids implanted under the left sternomastoid; this was followed by a severe attack of tetany which subsided and the general condition

improved. The duration of the improvement remains to be seen. A. H. PAYAN DAWNAY.

KOELLNER (14, **Hereditarily syphilitic fundus in a family of 7 children**) found, corresponding to the better or worse general condition, in one only depigmentation of the pigment epithelium and slight thickenings of the walls of the choroidal vessels, in the others a high degree of sclerosis of all the chorioidal vessels together with secondary symptoms. Wassermann's reaction was negative in all the children.

AUBINEAU and CIVEL (16, **Palpebral tumor and paralysis of the sixth nerve in Recklinghausen's disease**) observed in a man 33 years old, suffering from Recklinghausen's disease, a large tumor of the left upper lid and a paresis of the abducens. The latter was probably caused by an intracranial tumor. The tumor of the lid, with a larger one at the root of the nose, was the first localization of the disease. In addition the patient had about 60 little tumors and pigment spots of the skin. The tumor of the lid, as well as one from the skin, showed histologically a fibromatous nature, with a great abundance of cells and typical changes of the nerves and of the numerous sweat glands. CAUSÉ.

SALUS (16, **Erythema exudativum multiforme in the eye**) describes two cases of very severe croupous conjunctivitis with negative bacteriological findings, which he conceives to be a local manifestation of an erythema exudativum vesiculosum because of an analogous disease that affected the mucous membrane of the mouth at the same time.

In a case of erythromelalgia of the right leg that had lasted 5 years, CUPERUS (17, **A case of erythromelalgia and disease of the eye**) saw a similar clinical picture develop in the right eye with marked inflammatory symptoms and pain which was especially great at night. The keratitis underwent involution after ten days, the entire attack after six weeks. He considers the disease to be a vasomotor neurosis and that the prognosis is good. B. P. VISSER.

LAGRANGE (18, **A case of uræmic amaurosis in a pregnant woman**) reports the following case. The patient had had total blindness of both eyes for 14 days in the second month of

a pregnancy two years before, but no examination of the urine was made at that time. She suddenly became so blind in the seventh month of her last pregnancy that she could not go about alone. The urine was very albuminous and the patient was taken into the hospital on account of the danger of eclampsia, but the pregnancy continued to full term. Eight days after delivery, after she had been blind for two months and a half, the vision began to return gradually until that of each eye equalled 1. The ophthalmoscopic condition then was normal, but the field was greatly contracted, central vision alone being preserved. The defect of the visual field was permanent; the urine was free from albumin at the last examination. Albuminuric retinitis, retrobulbar neuritis, hysterical amaurosis, and simulation were excluded. The nature, pathogenesis, and symptomatology of uræmic amaurosis need further investigation. It is the consequence of an arterial hypertension with a local vascular spasm which interferes with the nutrition of the cortical visual centers. The preservation of the function of the macula alone can be explained by the theory that each macula has a bilateral center in the anterior part of the calcarine fissure. CAUSÉ.

III.—GENERAL AND EXPERIMENTAL PATHOLOGY AND TREATMENT. Reviewed by LOEHLEIN.

19. AUGSTEIN. **Studies of pigment on the living eye.** *Klin. Monatsbl. f. Augenheilkunde*, Jan., 1912, p. 1.

20. VAN DER HOEVE. **Lenticular opacities produced by naphthol.** *Nederl. Tydschrift v. Geneesk.*, 1912, vol. i., No. 5.

21. IGERSHEIMER. **Experimental studies of the action of salvarsan on the eye.** *Muench. med. Wochenschrift*, 1912, p. 729.

22. MARX. **The latency of bacteria in the injured eye.** *Archiv f. Ophthalmologie*, 80, 3.

AUGSTEIN (19, **Studies of pigment on the living eye**) says that the pigmentations on the surface of the eye are not congenital as they have been supposed to be,—for example, the pigment about the scleral veins,—but develop during the first year of life. These physiological pigmentations often increase after inflammations of the uvea. Pathological pigmentations in the anterior segment of the eye are usually due to the escape of the coloring matter of the blood from traumatism, but only when pigment cells are present; this is true not only

of the cases in which the increase of the pigment cells can be explained by the nature of the trauma, but also of others, in which the author thinks a wandering of the pigment cells to the surface takes place much more frequently than has been supposed.

VAN DER HOEVE (20, **Lenticular opacities produced by naphthol**) introduced into the stomach of a pregnant rabbit three doses of 1*g* per kilo of β-naphthol. All five baby rabbits had perinuclear cataracts which were more or less well marked.

B. P. VISSER.

IGERSHEIMER (21, **Experimental studies of the action of salvarsan on the eye**) finds that chronic salvarsan poisoning produces changes in the medullary sheaths of the optic nerve in cats.

MARX (22, **The latency of bacteria in the injured eye**) introduced very small quantities of staphylococcus aureus, streptococci, and pneumococci into the vitreous of rabbits. In half of the cases he obtained living germs from the eye after the lapse of months, but a true latency, *i. e.*, vitality of the bacteria found when the inflammatory symptoms had completely passed away, in only six. Yet these positive cases confirm the theory that it is uncertain in any given case in which infection has been present in an eye and the inflammatory symptoms have undergone involution whether germs which retain their vitality still exist in it or not. Hence if inflammation recurs in an eye which has apparently recovered from an infected wound it may be caused by the same agents that were originally introduced, which have been in a latent condition.

IV.—METHODS OF RESEARCH, REMEDIES, INSTRUMENTS, AND GENERAL OPERATIVE TECHNIQUE. Reviewed by LOEHLEIN.

23. COHEN. **Salvarsan and the eye.** *Deutsche med. Wochenschrift*, p. 626.

24. PITZMAN, M. **The antiseptic and germicidal properties of the silver salts and preparations.** *Amer. Jour. of Ophthalm.*, Jan., 1912.

25. EWING, A. E. **Argyrosis.** *Amer. Jour. of Ophthalm.*, April, 1912.

26. RYERSON, G. S. **On the use of radium in ophthalmology.** *Ophthalmology*, Jan., 1912.

27. MCKEE, H. **A new method of making film preparations to demonstrate the presence of the gonococcus.** *Ophthalm. Record*, Jan., 1912.

28. EHRHARDT, ANNA. **A new lid clamp.** *Amer. Jour. of Ophthalm.*, Feb., 1912.

COHEN (23, **Salvarsan and the eye**) observed an optic neuritis set in two months after an injection of salvarsan and lead almost to blindness. He ascribes the trouble to the remedy, because gray ointment and potassic iodide were without effect. In another case an iritis was made worse.

PITZMAN (24, **The antiseptic and germicidal properties of the silver salts and preparations**) shows by tabulating the results of his experiments what effects are produced by combinations of silver nitrate and bichloride of mercury with blood serum in different dilutions. It appears that the germicidal action takes place only when the albumin is insufficient to satisfy the affinity of the chemical salt. Thus, if the albumin is diluted one quarter it takes only one quarter the mercury or silver to cause the solution to be germicidal. Mercury albuminate shows no sign of antiseptic action, but when the affinity for albumin is satisfied the excess of bichloride is powerfully germicidal. Silver albuminate shows definite antiseptic action, and when strong the free nitrate acts as a germicide. Collargol and argyrol are without excess of the silver salt, but are antiseptic, while protargol, ichthargan, albargin, and novargan are strong germicides because they contain free nitrate of silver.

ALLING.

EWING (25, **Argyrosis**) relates cases of ulceration of the cornea which were stained by the continued use of argyrol. In each case the stain was found to affect only the portion which healed first, where the capillaries were formed, as the elastic fibres are particularly susceptible. He had the opportunity to study two fresh specimens of argyrosis, one in which the tissue had been discolored as the result of the rupture of the lachrymal sac during the injection of argyrol, the other a case of conjunctival and subconjunctival staining. In the latter the vessels and lymph spaces of the papillæ were deeply stained, while the blood-vessels were wholly blackened. Black and brown masses were also distributed through the adenoid layer. The elastic fibres, Meibomian glands, muscles, and fat were affected. The white blood cells seem to take part

in distributing the pigment. There were many discolored fat cells showing fatty acid like agglomerated crystals.

ALLING.

RYERSON (26, **On the use of radium in ophthalmology**) discusses the physical properties of radium and its physiological action upon the eye. Therapeutically it acts only upon the external structures, being more or less effective in such conditions as rodent ulcer, angioma, and epithelioma of the lid. A sarcoma of the eyebrow was cured by its application. It gives fairly good results in trachoma and vernal catarrh. Sixteen out of seventeen corneal ulcers responded rapidly.

ALLING.

MCKEE (27, **A new method of making film preparations to demonstrate the presence of the gonococcus**) recommends the Giemsa stain as especially useful in demonstrating pneumococci or gonococci when present in the epithelial cells.

ALLING.

The instrument invented by EHRHARDT (28, **A new lid clamp**) is used in the resection of the tarsus and consists of a clamp with a plate on one arm and a serrated edge on the other. The latter part is applied to the conjunctival side of the lid and tightly secured by means of a set screw.

ALLING.

V.—ANATOMY, EMBRYOLOGY, MALFORMATIONS. Reviewed by PAGENSTECHER.

29. COSMETTATOS. **The development of the iris and the formation of the anterior chamber in man.** *Arch. d'ophtalm.*, xxxi., p. 655.

30. BECKER, HERMANN. **Cases of anophthalmus congenitus monolateralis.** *Muenchener med. Wochenschrift*, 1912, No. 14, p. 782.

COSMETTATOS (29, **The development of the iris and the formation of the anterior chamber**) says that after the lens has separated from the outer epithelium at the end of the second month the space between the lens and the cornea becomes filled with the mesodermal tissue surrounding the secondary optic vesicle. In the third month this divides into an anterior and a posterior layer: the former grows fast to the cornea and becomes Descemet's membrane with endothelium; the latter forms the pupillary membrane. The latter is about as thick as the cornea, but tapers off toward the center,

and especially toward the lens. An opening between the cornea and the pupillary membrane is to be seen at this time, which is to be regarded as the first rudiment of the anterior chamber. During the fourth month this gradually enlarges and the first differentiation of the tissue into the endothelium of the cornea and the base of the pupillary membrane is to be seen in the sinus of the chamber. The other parts of the membrane undergo involution. In this stage a notable change is to be seen in the anterior part of the secondary optic vesicle, a thickening of the pigmented portion, the first rudiment of the ciliary body. The development advances in the fifth month, the retinal pigment layer of the iris is formed through the anterior part of the optic vesicle; the sinus annularis is to be seen distinctly. The retinal layer of the iris is covered by the pupillary membrane, which now becomes somewhat thickened again to form the mesenchym of the iris. Instead of the oval form it has hitherto preserved, the anterior chamber assumes an angular shape. In the sixth month the iris measures *½mm;* both of its layers are strongly pigmented, and the circular fibres of the sphincter pupillæ can be distinguished. The system of the sclero-corneal trabeculæ can be differentiated in the sinus of the chamber. In the seventh month the iris is *1mm* long, the sphincter is well developed. The eighth month brings no notable advance, in the ninth the iris is completed, and a thread-like trace of the pupillary membrane hangs from the pupillary margin into the anterior chamber; as a rule, this has disappeared at the time of birth.

CAUSÉ.

BECKER (30, **Cases of anophthalmus congenitus monolateralis**) reports two cases of congenital anophthalmus. One was characterized by atrophy of the entire right side of the face, arrested development of the right forearm, with absence of the radius, of six carpal bones, and of the right thumb. The right eye was totally absent, the orbit was funnel-shaped, shallow, and lined with mucous membrane. Microblepharia was present. The second case was one of microphthalmus and anophthalmus congenitus. An opacity of the cornea could be seen in the microphthalmic eye, which cleared up somewhat after birth, as well as a coloboma of the iris. The fourth and fifth toes of the left foot were grown together.

VI.—PHYSIOLOGY OF NUTRITION AND INTRAOCULAR TENSION. Reviewed by WESSELY.

31. WESSELY. **Contribution to the study of the intraocular change of fluid and of the tension of the eye.** *Sitzungsbericht d. Phys-med. Gesellschaft*, Wuerzburg.

32. ROLLET and CURTIL. **Studies of ocular tonometry.** *Revue générale d'ophtalmologie*, XXX., p. 481.

WESSELY (31, **Contribution to the study of the intraocular change of fluid and of the tension of the eye**) induced glaucoma with deep anterior chamber, complete occlusion of the sinus of the chamber, and buphthalmic enlargement of the eye in new-born rabbits by discission of the lens and then instituted filtration experiments. These showed that filtration from the eye was totally abolished. Apparently complete seclusion of the pupil, on the contrary, always proved permeable to the current of filtration. Peripheral iridectomy brought the buphthalmic growth to a standstill. The experiment demonstrates anew the importance of the sinus of the anterior chamber as the principal efferent passage.

Further evidence was obtained of the dependence of the intraocular tension upon the blood pressure. Exceptions occur only when the change of blood pressure is due to a change in the caliber of the peripheral vessels. Thus amyl nitrite, caffein, or antipyrin causes a rise of the intraocular tension even when the blood pressure is low. Such drugs may therefore occasionally take part in the excitation of an attack of glaucoma. Wessely warns against ascribing too great importance to the absolute values found with Schioetz's tonometer. The instrument is gauged on the cadaveric eye and a test at different times after death gives very different values.

ROLLET and CURTIL (32, **Studies of ocular tonometry**) have tested the action of various drugs upon the tension of the normal eye by means of measurements with Schioetz's tonometer. The first measurement was made five minutes after the instillation of the drug, and then every five minutes until the return of the tension to normal. Any change in the size of the pupil was noted at the same time. A tension between 18 and 25*mm* of mercury was assumed to be normal. Holocain has no influence upon the tension or the size of the pupil,

its anæsthetic effect is weak and of short duration. Cocaine causes a slight hypertension with a more lasting dilatation of the pupil. Tropacocain and acoin resemble holocain in their effect, while alypin has a distinct hypertensive property. Stovain, novacain, and eucain B cause a transient burning, but the latter only increases the tension. Atropine results in a prompt and marked hypertension, especially in an eye in which the tension is below normal, the dilatation of the pupil begins five minutes after the instillation. Euphthalmin increases the tension markedly, while duboisin does not affect the tension at all, and scopolamin very little. The dilatation of the pupil is very slow and incomplete with both of the latter drugs. Pilocarpine does not reduce the tension of the normal eye, eserine reduces it very slightly. The latter is considerably more powerful than the former in the glaucomatous eye. Dionin does not modify the tension. Adrenalin often has an immediate marked, hypotensive action, especially upon an inflamed eye.

CAUSÉ.

VII.—PHYSIOLOGY AND PATHOLOGY OF THE SENSE OF SIGHT.

Reviewed by KÖLLNER.

33. MONTGOMERY. **A simple method for the study of entoptic phenomena.** *Journal of Philosophy*, ix., p. 204.

34. VOGT. **Experimental studies concerning the permeability of the transparent media of the eye to the ultra-red of artificial light.** *Archiv f. Ophthalmologie*, lxxxi., 1, p. 155.

35. STEPHENSON, SYDNEY. **On cases of night blindness with peculiar conjunctival changes of children.** *The Ophthalmoscope*, Jan.–March, 1912.

36. WILTON. **Color sensation.** *The Ophthalmoscope*, Jan.–March, 1912.

37. LOHMANN. **The theoretic importance of certain phenomena of color pathology.** *Zeitsch. f. Sinnesphysiol.*, xlvi., 3, p. 129.

38. BOURLAND. **A case of ophthalmic migraine.** *Ann. d'oculistique*, cxlvii., p. 114.

39. ZENTMAYER, WM. **A case of migraine with ring scotoma.** *Annals of Ophthalmology*, April, 1912.

40. OVIO. **The cyclopic image in the plane mirror.** *Archives d'ophtal.*, xxxi., p. 710.

MONTGOMERY (33, **A simple method for the study of entoptic phenomena**) hangs little silvered balls on threads before each eye in a spectacle frame, so that they form images on

various places of the retina. In this way the reflex movements of the pupils can be observed and measured.

VOGT (34, **The permeability of the transparent media of the eye to the ultra-red of artificial light**) comes to the following conclusions: Only such ultra-red rays can pass through the refracting media as come from white-hot bodies; scarcely any from red-hot bodies, and none from bodies with less heat can pass. The abundant ultra-red rays of the electric light reach the retina in far greater numbers than the visible rays. Such ultra-red rays can be absorbed previously only by very thick layers of water. The harm done to the macula lutea by blinding by the sun may likewise be ascribed to the ultra-red rays. Artificial lights, especially electric, emit far more of these rays than are contained in natural light; hence it is possible that many diseases of the eye are promoted by artificial light. These rays are also to be taken into account in glassblowers' cataract, for they reach the lens in greater numbers than other rays, are densest in the posterior part of the lens, and are absorbed more by the lens than by the other media. The assumption is incorrect that the limit in the spectrum between ultra-red and visible red coincides with the limits of diathermancy of the media of the eye.

In children with conjunctival xerosis but not proven night blindness STEPHENSON (35, **On cases of night blindness with peculiar conjunctival changes of children**) frequently observed a contraction of the visual fields for red and green, less constantly for white. The fundus appears pale, the reflexes are increased. Careful examination shows that the children, although they may appear healthy at first glance, are strumous. He thinks the cause of the disease to be a slight disturbance of nutrition, which can be recognized from a reduction of the hæmoglobin and a change in the color index of the blood.

GILBERT.

WILTON (36, **Color sensation**) reports the case of a hypermetropic woman 45 years old to whom the test letters appeared to be colored blue and yellow up to the distance of $\frac{2}{3}$ of a meter. This phenomenon disappeared as soon as the hypermetropia was corrected.

GILBERT.

LOHMANN (37, **The theoretic importance of certain phe-**

nomena of color pathology) confirms the observation made by v. Reuss that the zigzag lines in scintillating scotoma appear in the complementary colors when the patient looks through a colored glass. According to Reuss the complementary colors are seen with the most difficulty when looking through a green glass, but Lohmann says it is when a red glass is used. In a patient with color hearing there was no blending of the two colors when diphthongs were pronounced, but they were perceived separately, with the exception of the umlauts o and u, when a mixed color was seen; for example, o = yellow, e = red, ö = orange. Probably the audible perception of the two elements plays a part in the separate vision of colors, and the audible mixture of sounds in the other case produces a mixture of colors.

BOURLAND (38, **A case of ophthalmic migraine**) observed in a soldier who suffered from hemicrania the rare form of scintillating scotoma which is localized in the upper portions of the visual fields. The patient recognized the onset of the attack, which was otherwise typical, from the appearance of two dark spots in his visual field.

ZENTMAYER'S (39, **A case of migraine with ring scotoma**) patient suffered from attacks of migraine associated with hemianopsia. There was a temporary negative ring scotoma 10° in width situated between the limits of the form and red fields and concentric with them. The observations were made between attacks. It might be explained as a vasomotor disturbance in the vessels which assume an arched form about the macula.

ALLING.

OVIO (40, **The cyclopic image in the plane mirror**) pictures a physiological optical phenomenon that has not been described before, which he denominates the cyclopic image in the plane mirror. If one fixes a point in a plane mirror 1 meter distant without focussing on the true image, an image with three eyes appears first and then an upright cyclopic image. He constructs this phenomenon from the diplopia which arises from the fact that the eyes are accommodated not upon the image but upon the mirror, which is situated only half as far away from the observer, and a double image of the face is formed, the inner portions of which partially cover each other.

The lateral portions are then excluded by psychic abstraction, so that the image seems to have but one eye.

CAUSÉ.

VIII.—ACCOMMODATION AND REFRACTION. Reviewed by KÖLLNER.

41. HOWE. **The crystalline lens as figured in the text-books and as seen in the eye.** *Ophthalmology*, 1912, p. 160.

42. HEGNER. **A new system of glasses for the correction of monolateral aphakia.** *Klin. Monatsbl. f. Augenheilkunde*, I., 3, p. 273.

43. KOSTER. **Stereoscopy in the vision of astigmatics.** *Festschrift to Hector Treub.* Leiden, 1912.

According to HOWE (41, **The crystalline lens as figured in the text-books and as seen in the eye**) the descriptions given of the form and position of the lens, especially during accommodation, are not correct. Measurements made with Javal's ophthalmometer show: (1) that the anterior end of the axis of the lens is usually displaced a little to the temporal side and somewhat downward; (2) that during accommodation the lens moves slightly downwards; (3) that the posterior surface changes little during accommodation, while the anterior surface arches so that its middle part becomes almost conical. These facts have been determined by measurements, and are not the results of theoretical calculations.

HEGNER (42, **A new system of glasses for the correction of monolateral aphakia**) reports the results he has obtained by the correction of monolateral aphakia with v. Rohr's system of glasses. These glasses give with full correction of the aphakic eye a size of the image corresponding to that of emmetropia, so that binocular vision can be maintained. The system of glasses is contained in an aluminum capsule 1.5*cm* broad; its weight is not much greater than that of the ordinary cataract glass. In two cases the glasses were worn with comfort and gave a good stereoscopic vision.

KOSTER (43, **Stereoscopy in the vision of astigmatics**) thinks that the usual explanation of the metamorphopsia in astigmatics with correcting glasses does not suffice, particularly not for the false stereoscopy, which can only be explained by unlikeness of the retinal images in the two eyes. The nodal points of the different meridians cannot fall together

after the most accurate correction of astigmatism. The image in the corrected weaker meridian is somewhat the larger. The distortion of the image which ensues is exactly the opposite of that in the uncorrected eye and has its greatest value in a symmetrically oblique position of the principal meridians. The disappearance of the false stereoscopy during the wearing of a glass is not to be explained by a nativistic theory.

B. P. VISSER.

IX.—THE MOTOR APPARATUS OF THE EYES. Reviewed by KÖLLNER.

44. BYRNE. **On the physiology of the semicircular canals and their relation to seasickness.** New York, I. T. Dougherty.

45. UFFENORDE. **The reaction of the ocular muscles to labyrinthine irritation.** *Berl. klin. Wochenschrift*, p. 671.

46. STIRLING. **Some unusual cases of nystagmus.** *Ophthalmoscope*, Jan.–March, 1912.

47. ELLIOT. **A case of voluntary nystagmus.** *Ibid.*, Jan.–March, 1912.

48. INOUYE. **A remarkable case of paresis of the inferior oblique.** *Klin. Monatsbl. f. Augenheilkunde*, l., 2, p. 218.

49. BRADBURNE. **Hereditary ophthalmoplegia in five generations.** *The Ophthalmological Soc. of the United Kingdom*, Jan. 25, 1912.

50. POSEY. **A case of congenital ptosis.** *Ophthalm. Record*, p. 155.

51. VERREY. **A case of unilateral mydriasis of dental origin.** *Annales d'oculistique*, cxlvii, p. 188.

52. LEMPP. **Further studies concerning the position of rest of the eyeball.** *Inaugural Dissertation*, Berlin.

53. DIMMER. **The operative treatment of strabismus.** *Wiener klin. Wochenschrift*, xxv., No. 1.

54. SCHOEN. **A case of vertical strabismus of 120 years ago, according to the observations of the patient, and one of to-day.** *Muenchener med. Wochenschrift*, No. 7, p. 361.

BYRNE (44, **On the physiology of the semicircular canals and their relation to seasickness**) deals with the physiology of the vestibular apparatus, its relations to the ocular muscles, as well as the influence of the cerebrum and cerebellum, from the point of view of the etiology of seasickness, taking into account the experimental studies that have been made concerning its thermic, mechanical, and electrical excitation. The nystagmus that is caused by rotations is a co-ordinated movement which is excited through labyrinthine pressure that acts upon centers situated in and about the middle lobe of

the cerebellum. The excitable organs in the ampullæ of the semicircular canals have intimate relations with definitely defined portions of the cerebellum, *e. g.*, the right and left horizontal semicircular canals are connected with the centers situated to the right and left near the pyramid of the middle lobe. With the aid of these relations and the corresponding nystagmus it is possible to localize lesions in the peripheral vestibular apparatus and in the cerebellum.

According to UFFENORDE (45, **The reaction of the ocular muscles to labyrinthine irritation**) the caloric test of the reaction of the ocular muscles from the labyrinth is the most valuable method. When the result is negative it must be taken into consideration that the action of cold may be weakened by granulations. The compression symptom does not depend on an uninjured membranous labyrinth; when the labyrinth has been totally destroyed and it can be demonstrated that the nerves of the ampulla no longer react, a reaction can still be excited by pressure upon the trunk of the vestibular nerve. In the galvanic excitation of the labyrinth the condition is not one of cataphoretic action upon the endolymph, but one of a direct nerve stimulation, for the reaction can still be excited when the membranous labyrinth has been completely destroyed.

STIRLING (46, **Some unusual cases of nystagmus**) reports a case of voluntary nystagmus, one of nystagmus with tremor of the head, one of albinism with nystagmus and persistent foramen ovale, and two of almost albinotic girls with amblyopia, but not nystagmus.

GILBERT.

ELLIOT (47, **A case of voluntary nystagmus**) also reports a case of binocular horizontal oscillatory nystagmus in a man 30 years old, who had been able to produce it from early childhood. GILBERT.

INOUYE (48, **A remarkable case of paresis of the inferior oblique**) analyses a case of vertical double images of an atypical character, leaving it open whether inferior rectus of the left eye or the inferior oblique of the right eye was paretic. The change in the vertical distance of the double images in inclination of the head to the right and left favors a paresis of the right inferior oblique. The explanation is to be sought in a

spastic contraction of the antagonist, the superior oblique, which still prevails after recovery from the paresis. The visual field also indicates a motor disturbance of the right eye.

BRADBURNE (49, **Hereditary ophthalmoplegia**) observed ptosis with almost total loss of the ocular movements in five generations. The explanation given is that of a muscular anomaly. The question of atavism is thoroughly discussed.

POSEY (50, **A case of congenital ptosis**) reports the case of a boy on whom he had performed successfully a Panas operation for congenital ptosis. The operation has the advantage that the amount of correction desired may be accurately gauged.

GILBERT.

The late cutting of a wisdom tooth in a woman 34 years old caused mydriasis and severe neuralgic pains in the affected side of the face, as VERREY (51, **A case of unilateral mydriasis of dental origin**) reports. According to the statement of the patient, the pupil first became large at the time the tooth appeared and the mydriasis promptly disappeared as soon as the tooth was extracted. The accommodation was perfectly normal. He thinks it a spastic mydriasis from a reflex exci a-tion of the sympathetic.

LEMPP (52, **Position of rest of the eyeball**) finds orthophoria to be only one of the physiological positions of rest of the eye-ball from a study of 425 persons. He found it present in only 25½%, while esophoria could be demonstrated in 40½%, and exophoria in 34%. The refraction exerts only a slight influence, exophoria is rather more frequent in myopia, eso-phoria in hypermetropia. As age advances esophoria seems to decrease in frequency, while exophoria increases. Perhaps the explanation of this phenomenon may be that the early degenerative changes thought demonstrable in the ocular muscles are usually first noticeable in the internal rectus.

DIMMER (53, **The operative treatment of strabismus**) prefers the double advancement of Landolt to other methods, es-pecially to tenotomy. After-treatment consists of six or seven days of rest in bed and bandage with atropine, followed by stereoscopic exercises with accurate correction with glasses. He does not consider that the position obtained need be absolutely accurate, for this will be cared for later by the tendency to fusion. The operation can be performed at the

age of from 4 to 6 years when conservative treatment has failed.

SCHOEN (54, **Vertical strabismus**) refers to the careful observations made by a patient on himself 120 years ago, which portray troubles that coincide, in his opinion, with those produced by vertical strabismus. He then reports two cases of considerable and obstinate vertical strabismus in whom a considerable improvement of general neurasthenic troubles was gradually obtained by its correction, and two milder cases in which prism correction gave prompt relief.

X.—LIDS. Reviewed by KRAUSS.

55. CAVARA. **The use of radium in epithelioma of the lids.** *Annales d'oculistique*, cxlvi., p. 256.

56. ELSCHNIG. **Anomalies in the form of the palpebral fissure.** *Klin. Monatsbl. f. Augenheilkunde*, Jan., 1912, p. 17.

57. ELEUTHERIADES. **Combined tarsoleptinsis. A radical operation for trachomatous entropion and trichiasis.** *Arch. d'ophtalm.*, xxxi., p. 716.

58. FERGUS. **Ptosis operations.** *Ophthalmic Review*, xxxi., p. 33.

59. HILDESHEIMER. **Herpes zoster ophthalmicus gangrænosus.** *Zentrabl. f. prakt. Augenheilkunde*, March, 1912, p. 77.

60. KNOEPFELMACHER. **Vaccination pustules on the eyelids.** *Muenchener med. Wochenschrift*, xiv., p. 789.

61. KUMAGAI. **The fate of a flap of cartilage from the ear used in a plastic operation on the lids.** *Klin. Monatsbl. f. Augenheilkunde*, Feb., 1912, p. 168.

62. MORAX and LANDRIEU. **Hyaline degeneration of the submucous tissue.** *Klin. Monatsbl. f. Augenheilkunde*, March, 1912, p. 340.

CAVARA (55, **Use of radium in epithelioma of the lids**) had had very good results from the use of radium in the treatment of epithelioma of the lids, but the sittings must be long and the rays used in large quantities. A perfect result can be obtained from radium alone even when the epithelioma is large and grave. It is important that the apparatus employed should have a powerful action; the particles of radium should not be movable in the instrument; it is best that they should be cemented fast. The "harder" rays prove the most efficient. The sittings should be from one to three hours long. A harmful effect on the eye is impossible in shorter irradiations; in the longer it is easy to protect the eye by a proper direction of the rays. Short sittings of from 5 to 30 minutes are very useful in small superficial epitheliomata. In many cases,

when it is desired to act upon the deeper layers of the tumor, partial radiation is to be recommended, *i. e.*, to have the weaker rays excluded by the interposition of a metal plate. A rapid and positive effect is obtained if the superficial layers are shaved off before the application of the rays. Radium therapy is indicated in all cases in which the orbit has not been invaded and the eyeball is not involved. It has the same indications as, and many advantages over, surgical intervention. Cavara says nothing in regard to recurrences because his cases have been under observation too short a time.

CAUSÉ.

ELSCHNIG (56, **Anomalies in the form of the palpebral fissure**) deals in the first part of his work with blepharophimosis, epicanthus lateralis, and entropium, in the second with abnormal length of the palpebral fissure. After a brief review of the theories, in which ankyloblepharon and blepharophimosis have been erroneously confused, the author describes the various occurrences which may lead to a shortening of the palpebral fissure without abnormal adhesion of the margins of the lids, for which alone the name ankyloblepharon should be reserved. The first form is met with in old people with a senile condition of the skin; the palpebral fissure is shortened horizontally, the outer commissure may reach to or beyond the margin of the cornea, while otherwise the configuration of the lid is quite normal. Blepharospasm is present only when this condition is developed to a high degree. Tension on the skin of the temple brings the outer commissure back to its right position. This true blepharophimosis is almost always bilateral. Its cause is a relaxation of the outer palpebral ligament, or of the fascia tarso-orbitalis; blepharospasm is an aiding factor. A similar condition is transiently present with every strong closure of the lids when either the external canthus alone is moved inward, or the adjacent skin of the temple is moved with it so as to overlie the canthus. Both of these are to be seen in an extreme degree in tic convulsif in which entropion of both lids may also be present. This true blepharophimosis may be observed as a transient anomaly in blepharospasm and is prevented from becoming stationary by the elasticity of the palpebral ligament alone. Two other forms

of true blepharophimosis occur in trachoma in young people, usually associated with entropion. The second form is incurable, that caused by a cicatrix. Elschnig distinguishes blepharophimosis vera senilis, spastica, or cicatricea from epicanthus lateralis congenitus or spasticus, in which the temporal skin of the lid is drawn in a fold over the outer canthus. This is caused exclusively by a spasmodic contraction of the orbicularis, which is also apt to cause entropion. Elschnig gives three possible causes for this entropion. One is the effort to keep the lids open while the spasm of the orbicularis shoves the loose skin of the lid over the margin of the tarsus into the palpebral fissure. The second is the cicatricial shortening of the conjunctiva and tarsus in the region of the Meibomian glands, which produces entropion without aid from the orbicularis, while the third is a combination of these two factors. He explains a congenitally too long palpebral fissure by the supposition that when the latter opened in embryonal life the dehiscence was of too great an extent, so that the lids are opened too wide in proportion to the size of the globe and of the orbit, or that from the start the rudiments of the lids were not proportioned to the size of the globe. There is no special clinical importance to this rare anomaly.

ELEUTHERIADES (57, **Combined tarsoleptinsis**) recommends an operation which he calls combined tarsoleptinsis for the treatment of trachomatous entropion and trichiasis. After an incision and extirpation of a flap containing skin and muscle he lays bare the margin of the tarsus next the margin of the lid, shortens it about 1 or 1½*mm* and thins the surface. Then the edge of the lid and the lower margin of the tarsus is joined to the upper skin of the lid by sutures introduced in the intramarginal portion and tied above. The procedure is simple and has given good results. CAUSÉ.

FERGUS (58, **Ptosis operations**) recommends the following procedure: Incision through the skin parallel to the free margin of the lid, a second curved one above; removal of the strip of skin thus marked out: suturing of a piece of the tarsus to the fascia of the occipitofrontalis. The operation is unsuited only for those cases in which the occipitofrontalis is congenitally absent or imperfectly developed. GILBERT.

In HILDESHEIMER'S (59, **Herpes zoster ophthalmicus gangrænosus**) case, while the lesions on the eyeball healed, numerous gangrenous eruptions appeared over the entire left side of the face and spread over the bridge of the nose beyond the middle line to the brow on the other side. Anæsthesia dolorosa was also present.

KNOEPFELMACHER'S (60, **Vaccination pustules on the eyelids**) patient had been vaccinated 11 days before and had transmitted the lymph to the eyelids, where it had given rise to pustules which were almost simultaneous with those on the arm. The diagnosis was confirmed by inoculation of the cornea of a rabbit. No immunity was produced by the vaccination on the cornea, but anaphylaxis was produced as shown by a reaction to re-inoculation 24 hours later.

KUMAGAI (61, **The fate of a flap of cartilage from the ear used in a plastic operation on the lids**) had the opportunity to examine histologically a piece of the cartilage of the ear used as a flap five months after the operation. In addition to the great atrophy he found two changes: one the resorption of the cartilage cells, probably caused by vacuolization of the protoplasm and hyalinogenous degeneration of the intracellular substance of the cartilage; the other the entrance of new bands of connective tissue from the surrounding tissue into that of the cartilage, probably by way of the rows of cartilage cells.

MORAX and LANDRIEU (62, **Hyaline degeneration of the submucous tissue**) describe a case of hyaline degeneration of the submucous tissue of the eyelids met with in a patient 60 years old. When the lids were everted large brownish hypertrophies of irregular form were to be seen in the conjunctivæ of the tarsus and transition folds. These were cut away. The bacteriological examination was fruitless, but the histological examination confirmed the diagnosis. The epithelium was preserved over the diseased zone, at the margin of which ossification could be perceived; the connective-tissue elements were degenerated, softened, and structureless; deep in the tissue were hyaline masses, some giant cells, and a few plasma cells. The vessels were normal.

XI.—LACHRYMAL ORGANS. Reviewed by KRAUSS.

63. LUEDDE. **Gummatous inflammation at the inner canthus simulating dacryocystitis.** *Amer. Jour. of Ophthalmology*, Jan., 1912.

64. CHASE, E. P. **Puncta lachrymalia multiplicata.** *Ophthalmology*, April, 1912.

65. TOTI. **The results of rhinostomy of the lachrymal sac (dacryocystorhinostomy).** *Zeitschr. f. Augenheilk.*, xxvii., 2, p. 115.

An abscess at the inner canthus of the left eye was incised by LUEDDE (63, **Gummatous inflammation at the inner canthus simulating dacryocystitis**). Irrigation showed that the passages were free. The condition was not improved by the operation, but recovery finally was secured by the administration of large doses of potassium iodide.

GILBERT.

CHASE (64, **Puncta lachrymalia multiplicata**) found three separate puncta in the right lower lid; one occupying the usual position, another *2mm* nearer the inner canthus, and the third *3mm* internal to this. All opened into the canaliculus.

ALLING.

TOTI (65, **Results of dacryocystorhinostomy**) has performed this operation on over seventy cases in the past seven years. Mishaps have been due chiefly to an erroneous choice of cases and faulty knowledge of the technique, so he again presents his views. The operation should be performed in the majority of cases under local anæsthesia, produced by the external injection of novocain and adrenalin, and internal applications of cocaine and adrenalin, the latter to be made immediately after the external injection. A subsequent application is never needed if the above rule is followed. A hook-shaped, small chisel, with a very short angular hook and straight edge, is very useful for the removal of splintered pieces of bone clinging to the periosteum deep in the wound, or for the resection of such ethmoidal cells as may come in the way. It is used by drawing it from behind forward. An artificial elevation of the nasal mucous membrane for resection by means of the little finger or probe is not usually necessary, for it is sufficiently elevated and fixed by the tampon of cocaine and adrenalin previously introduced into the middle meatus. Resection of the nasal mucous membrane with a sharp spoon is not to be recommended. The first incision is made with a knife at the anterior margin of the piece of mucous membrane to be resected, the edge of which is then seized with forceps and incised below, above, and finally behind either with a

curved knife or with scissors. A double armed suture is used, introduced from within outward so as to join as much as possible of the deep tissues to little of the skin. One at least of the central sutures must join the periosteum of the temporal flap of soft tissue close to the anterior margin of the outer wall of the sac, in order to fix the latter as far forward as possible. If the position of the sutures is marked out the day before operation their rapid and exact introduction is facilitated. No pains should be spared to maintain a fine, exact line of sutures. A treatment per secundam, with complete or partial tamponade, is very rarely indicated; at least it becomes less and less indicated as the experience of the operator increases. Any unnecessary irritation or manipulation in the nose is to be avoided. The temporary tamponade of the nasal cavity during the operation is superfluous if the adrenalin has been properly used. The omission of the tamponade of the middle meatus after the operation is without disadvantage in some cases and may in the future perhaps be considered advantageous. Before the application of the dressing, sterile zinc ointment is applied to the sutures, the rima palpebralis, and the entire region of the orbit. The eye may be looked at at the end of 24 hours without pain, bleeding, or disturbance of the wound. In applying the dressing sufficient pressure should be made with protection of the eye. This is best done by pressing with the left forefinger the flap of soft tissue against the bony opening plainly to be felt behind it so that the anterior wall of the sac sinks as deeply as possible into it; the forefinger is then replaced by a rather hard ball of sterile cotton over which is placed a flat piece of gauze. A fairly firm bandage is then applied. This procedure also serves to check any interstitial bleeding. The keloid elevation of the scar, which appears in some cases for unknown reasons a few weeks after the operation, is temporary. In the worst cases it disappears in the course of six months, leaving the scar practically invisible. The test of the result by the passing of probes or irrigation is superfluous. Strict proof of ideal healing may be obtained by the fluorescin test, or by the chemical reaction of chloride of iron and salicylate of sodium. The former is simply instilled in the conjunctival sac; for the latter test a soft piece of cotton is wet with the fluid and in-

troduced into the anterior part of the middle meatus, when the blue violet stain is characteristic. In some cases the mouth of the canaliculus is visible rhinoscopically through the new opening.

XII.—ORBITS, INCLUDING EXOPHTHALMOS, ACCESSORY SINUSES. Reviewed by KRAUSS.

66. POST, M. H. **Exophthalmos from a bony tumor growing from the nasal wall of the left orbit.** *Amer. Jour. Ophthalmology*, Feb., 1912.

67. POSEY, W. C. **Small round-cell myosarcoma of orbit with extension into the eyeball.** *Ophthalmic Record*, Feb., 1912.

68. BAUMGARTEN. **Visual disturbances caused by affections in the nose.** *Monatschr. f. Ohrenheilk. u. Laryngo-Rhinologie*, 1911, vi., p. 633.

69. COOPER. **A peculiar-colored reaction on opening Tenon's capsule.** *Ophthalmoscope*, Jan.–March, 1912.

70. GUTMANN. **Diseases of the orbit after extraction of teeth.** *Zentralbl. f. prakt. Augenheilkunde*, March, 1912.

71. KOELLNER. **Enophthalmus traumaticus.** *Med. Klinik*, 1912, p. 422.

72. MARTIN, H. H. **Thrombosis of the cavernous sinus with report of a case.** *Ophthalmology*, Jan., 1912.

73. PIFFL. **Retrobulbar neuritis due to disease of the accessory sinuses.** *Zeitschr. f. Ohrenheilk. u. f. d. Krankh. d. Luftwege*, 1911, iii., p. 231.

74. POSEY, W. C. **Circumscribed orbital œdema from frontal sinusitis.** *Annals of Ophthalmology*, April, 1912.

75. TERRIEN. **Retro-ocular cyst and pseudomicrophthalmia.** *Arch. d'ophtalmologie*, xxxi., p. 787.

76. VASQUEZ-BARRIERE. **Voluntary exophthalmos in a case of dermoid cyst of the orbit.** *Klin. Monatsbl. f. Augenheilkunde*, March, 1912.

77. WEIDEMANN. **A contribution to the knowledge concerning ptosis adiposa, together with a case of spontaneous prolapse of the lachrymal gland.** *Inaugural Dissertation*, Koenigsberg, 1911.

78. WERTHEIM. **The importance, diagnosis, and treatment of empyemata of the accessory sinuses.** *Med. Klinik*, 1912, No. 11, p. 431.

The tumor operated on by POST (66, **Exophthalmos from a bony tumor growing from the nasal wall of the left orbit**) when examined by Alt was found to be a dilatation of the ethmoid cells filled with bloody mucus and presenting in the orbit.

A fifteen-year-old girl was seen by POSEY (67, **Small round-cell myosarcoma of orbit**), who gave a history of having developed an orbital cellulitis at one year of age, which gradually

subsided without the appearance of pus, leaving the eye slightly prominent. Two months before the examination the eye again became prominent, but no mass could be felt. A Kroenlein operation was performed and several nodular masses were removed together with the eyeball. The microscope showed the tumor to be composed of muscle fibres more or less inflamed and a small round-cell infiltration resembling sarcoma. The eyeball showed the vortex veins, as well as the ciliary body, to be filled with sarcoma cells. The pathologist regarded the growth as having originated in the blood-vessels and classified it among the endothelial neoplasms of the flat sarcoma type. ALLING.

BAUMGARTEN (68, **Visual disturbances caused by affections in the nose**) gives the clinical histories of four cases in which visual disturbances were caused by affections in the nose and relieved by rhinological intervention. When empyemata of the accessory sinuses are present in such cases they should be subjected to immediate and radical treatment, but intervention may be needed when such conditions are absent, as in a case of a large bulla ethmoidalis, or a great hypertrophy of the middle turbinate. Even minor changes in the nose should be rectified as thoroughly as possible when suspicion arises that they are the causes of eye disease. The author states that he has obtained brilliant results in this manner in a large number of cases, in acute neuritis, chronic papillitis, and retrobulbar neuritis. The rapid disappearance of the color scotoma was particularly marked in all. In one patient with blindness due to acute optic neuritis the latter underwent complete involution and recovered perfectly in a few days after treatment of an acute purulent ethmoiditis. The author believes that the rhinological treatment of these troubles, even when decoloration of the papilla has begun, opens up a fruitful field.

When COOPER (69, **A peculiar-colored reaction on opening Tenon's capsule**) opened Tenon's capsule he saw the entire field of operation assume a beautiful blue color. Possibly it was due to the presence of a soluble salt of the iron cyanogen group which changed its color on exposure to the air.

GUTMANN (70, **Diseases of the orbit after extraction of teeth**) reports three cases of this nature, two of which were

fatal. In the first case an abscess developed by way of the lymphatics in the right orbit and right frontal sinus from the infected socket of the right upper molar, which resulted in septic thrombosis of both cavernous sinuses, abscess in the left orbit, and death from meningitis and general sepsis. In the second case germs from the infected socket of the left upper incisor entered the circulation and caused septic thrombosis of the veins of the left orbit, which extended to the cavernous sinus. Death. A number of incisions were made along the margin of the orbit deep into the cellular tissue; traces of pus were obtained by some, none by others, but an extensive venous engorgement was evident. In the third case the extraction of the third from the last upper molar tooth was followed by an empyema of the antrum of Highmore which was cured through an opening in the canine fossa. The fundus exhibited the picture of a postneuritic optic atrophy, the cause of which was supposed to be an involvement of the upper wall of the antrum and of the optic canal in the suppurative process.

KOELLNER (71, **Enophthalmus traumaticus**) reports two cases of traumatic enophthalmos in which the Roentgenographs and the clinical condition showed a fracture to be present in the outer wall of the orbit at the point where the lateral radiation of the fasciæ of the ocular muscles was attached to the bone. The enophthalmos was moderate, the mobility of the eyes in all directions only slightly limited. Probably the cause of the enophthalmos lay in the enlargement of the space in the orbit by the depressed fracture and a tearing off of the attachment of the fascia.

MARTIN'S (72, **Thrombosis of the cavernous sinus**) case showed the usual symptoms—exophthalmos, dilated pupil, conjunctival œdema, paralysis of the extèrnal muscles, and dilatation of the veins. Later the second eye was affected and death followed. The origin of the infection appears to have been a furuncle in the nose. ALLING.

PIFFL (73, **Retrobulbar neuritis due to disease of the accessory sinuses**) reports three cases of this nature, and tells of the results obtained by the coöperation of the ophthalmic and oto-rhinologic clinics in Prague. 824 patients were examined together, almost 5% of the 12,000 eye cases. A positive rhinological condition was present in 583 of these,

chiefly diseases of the nasal mucous membrane, anomalies of the nasal septum, and diseases of the accessory sinuses. Nasal trouble was present in 30 out of 37 cases of retrobulbar neuritis, and of these seven had disease of the accessory sinuses.

POSEY'S (74, **Circumscribed orbital œdema from frontal sinusitis**) patient had prominence and pain of the right eye and a mass under the supraorbital rim on the temporal side. The outward and upward movements of the eye were restricted. The fundus was normal, except for dilated veins, and the field of vision showed only an enlargement of the blind spot. He had had nasal symptoms for ten years and a diagnosis of congestion of the frontal and ethmoidal sinuses had been made. A few drops of pus were evacuated from the orbital mass, which was considered an inflammatory œdema secondary to sinus infection. ALLING.

TERRIEN (75, **Retro-ocular cyst and pseudomicrophthalmia**) gives the pathological examination of a case which was taken at first to be a microphthalmos, but proved to be a congenital retrobulbar cyst of the optic nerve. The patient was a girl 8 years old. The enucleation was performed because of exophthalmos that had existed since birth. The cyst was attached to the posterior part of the eye, with which it had a common wall, and exceeded the latter considerably in size. It had developed not at the cost of the capsule of the globe, but within the optic nerve. The eye itself had an almost normal size and structure. The optic nerve and the layer of nerve fibres of the retina were wanting. The place of the papilla could be plainly seen as the retrobulbar cyst had developed a process in the situation of the optic nerve. The outer wall of the cyst was formed of a tissue similar to sclera and was lined with long connective-tissue cells. CAUSÉ.

VASQUEZ–BARRIERE (76, **Voluntary exophthalmos in a case of dermoid cyst of the orbit**) describes a case in which the patient was able to make pressure by strong contraction of the muscles of mastication upon a dermoid cyst that lay partly in the infratemporal fossa, partly in the orbit, so as to force its fluid contents into the orbital portion and so cause exophthalmos, diplopia, and a tumor-like swelling in the outer half of the lower lid and at the outer canthus. The eye was otherwise perfectly normal.

WEIDEMANN (77, **Ptosis adiposa**) gives the following conclusions: (1) Ptosis adiposa consists essentially of a displacement of fat into the lid, either as a hernia, or as a prolapse. (2) No unobjectionable observation has yet been made of symmetrical fatty tumors in the lids. (3) There are two forms: one the consequence or accompanying symptom of the pathological process underlying the blepharochalasis, *i.e.*, this can either encroach upon the septum orbitale or be confined to the lid alone. When the encroachment of the process upon the septum can be excluded there may perhaps be a congenital weakness of the septum orbitale, and the second form of ptosis adiposa may arise from this cause. (4) The spontaneous sinking of the lachrymal gland is to be primarily ascribed to the following two etiological factors, both in uncomplicated blepharochalasis and in ptosis adiposa: (a) the process underlying the blepharochalasis involves the connective tissue that holds the gland in place, causes it to atrophy and so to relax; (b) a congenital weakness of the connective tissue of the orbit. In addition to this the traction upon the gland by the prolapsed adherent fatty tissue in ptosis adiposa aids, and several causal factors may work together.

WERTHEIM (78, **Importance, diagnosis, and treatment of empyemata of the accessory sinuses**) has found empyema of the accessory sinuses in 10% of all the diseases of the throat, nose, and ear treated by him. Chronic empyemata cause the greatest variety of eye affections, and therefore it is very important that their treatment should be considered from the standpoint of the ophthalmologist. Among the serious eye complications are cellulitis of the orbit, abscess of the orbit, and retrobulbar neuritis. Latent empyemata of the accessory sinuses, which run their courses without symptoms, or without notable disturbances, may give rise to very serious eye diseases and often an exploratory opening of these cavities is indicated, especially in cases of orbital abscess. All diseases of the nose and of their accessory sinuses deserve in this connection far more attention than has hitherto been accorded them.

XIII.—CONJUNCTIVA. Reviewed by WOLFRUM.

79. LOEHLEIN. **Clinical and experimental contribution to the question of the importance of the epithelial inclusions found in the eye.** *Arch. f. Augenheilk.*, lxx., p. 392.

80. v. HUNSEL. **Treatment of trachoma with sunlight.** *Geneskundig Tijdschrift von Nederl.* Indie, 1911, No. 6.

81. ROESSLER, F. **Treatment of trachoma with carbonic acid snow.** *Wiener klin. Wochenschrift,* 1912, No. 2.

82. STRAUB, M. **Treatment and prophylaxis of ophthalmia neonatorum.** *Festschrift Hector Treub.,* 1912.

83. ADAM and WAETZOLD. **Conjunctivitis tuberculosa (Parinaud's disease).** *Arch. f. Ophthalmologie,* lxxxi., p. 228.

84. DEUTSCHMANN, F. **Plasmon, the hyaline and amyloid degeneration of the conjunctiva.** *Zeitschr. f. Augenheilkunde,* iii., p. 242.

LOEHLEIN (79, **Importance of epithelial inclusions**) thinks that the cell inclusions in the inclusion disease of infants may be looked upon as the agent with a certain degree of probability. But the fact that the inclusions are frequently very sparse in trachoma of adults, are often absent indeed, as well as the fact that they are wanting in experimental inoculation, contraindicates their etiological importance in trachoma.

v. HUNSEL (80, **Treatment of trachoma with sunlight**) obtained good results in 80 patients by means of daily irradiation for ½ to 1 minute with the direct rays of the sun, associated with the weekly application of the copper stick. Without this last the result was not attained, at least not within from three to five months. Complications were observed in only four cases, while patients with acute trachoma or complications were not treated. Papillary trachoma gave the best results.

B. P. VISSER.

The treatment of trachoma with carbonic acid snow affords no advantage over the ordinary methods of treatment, with nitrate of silver, expression, and copper stick, according to ROESSLER (81, **Treatment of trachoma with carbonic acid snow**). The recovery is no quicker and the cicatrization is greater.

STRAUB (82, **Treatment and prophylaxis of ophthalmia neonatorum**) recommends, instead of Crede's method, cleansing of the eyes of new-born infants with a 0.1% solution of potassium permanganate.

B. P. VISSER.

ADAM and WAETZOLD (83, **Conjunctivitis tuberculosa**) studied clinically and experimentally a case of this nature. Tubercle bacilli were found in only one place in the sections,

while experimental inoculations of rabbits and guinea-pigs produced typical tuberculous changes. Whether the tuberculosis was of the bovine or human type could not be determined.

DEUTSCHMANN (84, **Plasmon**) observed a plasmon of the conjunctiva of the upper lid. It was composed of plasma cells, the origin of which, in his opinion, was from the connective tissue cells. In addition to the formation of plasma cells hyaline and amyloid degeneration was met with.

XIV.—CORNEA AND SCLERA. Reviewed by WOLFRUM.

85. EPPENSTEIN, A. **The vertically oval form of the cornea.** *Zeitsch. f. Augenheilkunde*, March, 1912.

86. MAGITOT. **The possibility of preserving the human cornea for a long time in a living condition.** *Berl. klin. Wochensch.*, No. 10, p. 470.

87. METAFUNE. **Studies of epithelial inclusions in the normal and diseased cornea.** *Annal. d'oculistique*, 146, p. 251.

88. REBER, W. **A case of hyaline degeneration of the cornea.** *Ophthalmic Record*, Dec., 1911.

89. CHARLES, J. W. **Serpiginous ulcer. Complete involvement of cornea. Recovery under mixed vaccines and urotropin.** *Amer. Jour. of Ophthalmology*, May, 1912.

From the study of the form of 100 corneæ, 50 of persons suffering from hereditary syphillis, 50 of normal persons, EPPENSTEIN (85, **The vertically oval form of the cornea**) concludes that the vertically oval form may occur as an anomaly of development, but may also be caused by a disproportion between the firmness of the cornea and the intraocular pressure. An etiological factor for such a symptom complex may, among other things, be interstitial keratitis due to hereditary syphilis.

A glaucomatous eye, the cornea of which was anæsthetic and opaque at the time of enucleation was placed by MAGITOT (86, **The possibility of preserving the human cornea for a long time in a living condition**) in a hæmolytic serum of another person. After a few hours the cornea cleared up and a week later it was taken from the serum and used for transplantation to a third person. It healed in place smoothly and remained transparent during seven months of observation.

METAFUNE (87, **Epithelial inclusions in the cornea**) examined the epithelium of normal and diseased corneæ for the

presence of the Halberstaedt–Prowazek inclusions, but could find them in none of the 28 cases, including three of trachoma.

CAUSÉ.

The cornea in REBER'S (88, **Hyaline degeneration of the cornea**) case although superficially smooth showed an irregular oval patch, 5*mm* by 7*mm*, which was of the color of old ivory and apparently just underneath the epithelium. There was a history of having had something in the eye followed by an opacity, which had gradually increased to its present size during the past four years. He is inclined to think the condition a hyaline degeneration which is not uncommon as a secondary phenomenon, but must be rare if primary.

ALLING.

It was observed that the eye treated by CHARLES (89, **Serpiginous ulcer treated by vaccine and urotropin**) became worse when the urotropin was stopped, the cornea turning yellow and the anterior chamber refilling with pus. The recovery is attributed to the medication and to the increased resistance induced by the vaccine, although when last seen the patient had only light perception.

ALLING.

XV.—IRIS AND PUPILS. Reviewed by NICOLAI.

90. HESSE. **Contribution to the mechanics of the movements of the iris, together with remarks concerning the innervation of the muscles of the iris.** *Klin. Monatsbl. f. Augenheilkunde*, Feb., 1912.

91. ERLENMEYER, A. **Periodic onset of a changing pupil.** *Berl. klin. Wochenschrift*, 1912, p. 539.

92. JARNATOWSKI. **A case of hippus iridis and mydriasis of the left eye.** *Zentralbl. f. prakt. Augenheilkunde*, Feb., 1912.

93. HIRSCHBERG, J. **Vermiform contractions of the sphincter pupillæ.** *Zentralbl. f. prakt. Augenheilkunde*, Jan., 1912.

94. SICARD and GALEZOWSKI. **Horner's syndrome following injections into the ganglia of the trigeminus for facial neuralgia.** *Recueil d'ophtalmologie*, p. 225.

HESSE (90, **Movements of the iris**) studied the behavior of the pupil in a patient 16 years old from whom he removed a tumor of the orbit without being able to protect the optic nerve. He thinks that the strength of the sphincter overbalances that of the dilatator because its tonicity is the greater independently of the central organ. The static balance can

be determined only when the muscles are excluded and cannot contract. This case showed after atrophy of the muscles a dilatation of the pupil. It is also remarkable that the muscles functionated four years after the operation, and then atrophied. Hence it is to be supposed that the trophic unity was preserved unharmed, that the peripheral neuron was not affected by the section. This continuing contractility of the sphincter may be explained with the aid of the ciliary ganglion, but not that of the dilatator, for the long ciliary nerves were divided. Hesse thinks there must be an intraocular center for these muscles.

ERLENMEYER (91, **Changing pupil**) saw movements of the pupil that have not been hitherto described in a woman 48 years old. The pupils continually changed their forms, were sometimes round, sometimes oval, sometimes dumb-bell-shaped, with intermediate forms. The movements of the pupil resembled those of the amoeba. Warning was given of the approach of these attacks, which lasted about half a minute. They usually appeared on only one side. Hysteria was proven by the increased reflexes, the contraction of the field of vision, the absence of the corneal reflex, the hypæsthesia and hypalgesia of the cornea. The writer does not think this a form of hippus, but that it is a phenomenon of hysteria.

According to the definition of Gaupp, hippus iridis is a phenomenon in which the pupil rhythmically becomes larger and smaller independently of any sensory, psychic, or other form of stimulation. JARNATOWSKI (92, **Hippus iridis**) saw this picture in a woman 26 years old suffering from neurasthenia, who had mydriasis at the same time. The right pupil was *3mm*, the left *7mm* in diameter, and the left remained somewhat the larger when the pupils were contracted. Eserine and pilocarpine caused the mydriasis to disappear. The condition lasted 1½ years. No cause for the behavior of the pupils could be determined. There was no disease of the central nervous system and the neurasthenia alone could not explain the phenomenon.

HIRSCHBERG (93, **Vermiform contractions of the sphincter pupillæ**) reports a case of circumscribed hyperplasia of the sphincter which excited vermiform contractions. The patient was 73 years old, near-sighted, and the condition was acciden-

tally discovered on examination of an inflamed eye with Hartnack's loupe. The thickening was below, at the margin of the pupil; the contractions took place in the long axis. The thickening remained after the pupil was dilated. The phenomenon remained unchanged during 15 months of observation. A similar case has been described by Sattler, Jr.

SICARD and GALEZOWSKI (94, **Horner's syndrome following injections into the ganglia of the trigeminus**) observed paresis of the sympathetic, manifested through Horner's triad, in three cases which had been treated for trigeminal neuralgia by injections of alcohol into Meckel's and Arnold's ganglia. This paresis appeared only when the injection was made into both ganglia simultaneously through the foramen rotundum and ovale. Meckel's ganglion receives its fibres from the sympathetic plexus of the carotid, Arnold's from that of the middle meningeal artery. The paresis was observed for 6 months in one case, for a year in another, and for 18 months in the third. Horner's syndrome was alone, without vasomotor and excretory anomalies.

CAUSÉ.

XVI.—LENS. Reviewed by NICOLAI.

95. REIS, W. **Cystein reaction of normal and pathologically changed lenses.** *Arch. f. Ophthalm.*, lxxx., 3, p. 588.

96. COATS. **Crystal-like bodies in the lens.** *Ophthalm. Soc. of the United Kingdom*, Jan. 25, 1912.

97. GOURFEIN-WELT. **Lenticonus posterior in man.** *Arch. d'ophtalm.*, xxxi., p. 625.

98. LAZAREFF. **Experimental criticism of the autocytotoxic theory of senile cataract.** *Annal. d'oculistique*, cxlvi., p. 331.

99. TERSON. **The procedure of choice in the extraction of floating lens nuclei.** *Arch. d'ophtalmol.*, xxxi., p. 705.

REIS (95, **Cystein reaction of lenses**) gives the following results: Normal lenses give a strong cystein reaction, in which the peripheral and central layers cannot be distinguished. Cataractous lenses that are ripe give no cystein reaction, those that are immature give a weak reaction. Traumatic cataracts react positively. From these results interesting conclusions as to the biochemistry of normal and pathological lenses can be drawn; to mention one, the negative reaction depends upon

the absence of the cystein group in senile cataract, probably because of fatty degeneration of the lens fibres, as fat is negative to the cystein reaction.

COATS (96, **Crystal-like bodies in the lens**) found crystal-like bodies in the lens of a woman 69 years old, although they had not been seen clinically. They were round or oval, with fine converging lines by which the body was split up into a number of radially disposed sectors. The lens fibres formed a sort of capsule about the bodies. The patient had an over-ripe cataract.

The eye of GOURFEIN–WELT'S (97, **Lenticonus posterior**) 52-years-old patient was buphthalmic, with keratoglobus, and was enucleated on account of increased tension. A functional and ophthalmoscopic examination was impossible. On section the lens was found to have almost the form of a mushroom, the anterior surface of the lens forming the head, the posterior portion the pedicle. Microscopically the nucleus of the lens was found in its proper place, the cortex showed cataractous changes, and scattered throughout the lens substance were little black bodies which contained lime. Degenerative changes were present everywhere throughout all the membranes. Gourfein–Welt considers the diagnosis of lenticonus posterior to be difficult and believes that of the published cases he can exclude four as not of true, but of false lenticonus. The latter shows a marked difference in the refraction of the center and periphery of the lens and the most important differential sign of true lenticonus is wanting: the irregularity of the posterior lenticular image. This is because the lens retains its normal form in false lenticonus, and the difference in refraction is probably caused by histologic or histochemical changes in the nucleus. In doubtful cases a true lenticonus is favored by congenitality of the affection and the simultaneous presence of a posterior polar cataract. Hess's theory of the pathogenesis is the least objectionable. This is that the hyaloid artery in its involution exerts a tension upon the posterior capsule of the lens, which tears at its weakest place. The absence of the hyaloid artery on the ophthalmological examination is no proof that it may not have been the cause of the anomaly. The writer found in his case fibrous cords which originated from the retina were probably the result of an intrauterine

inflammation and perhaps played the part of the hyaloid artery in the production of the lenticonus.

CAUSÉ.

LAZAREFF (98, **Autocytotoxic theory of senile cataract**) concludes from his experiments that amboceptors specific for the lens exist neither in the serum of immunized rabbits, nor in that of normal or cataractous men. He believes that the explanation of the origin of senile cataract is to be found in the senile loss of soluble albumins from the lens, while the lens capsule, changed chemically and structurally by age, is permeable for substances which it normally turns aside.

CAUSÉ.

For the extraction of small floating lens nuclei, which very easily change their positions either in front of or behind the pupil, TERSON (99, **Extraction of floating lens nuclei**) recommends to contract the pupil as much as possible with eserine before anæsthetization, then to transfix the nucleus with a long, very fine, sharp discission needle and have it held upward and inward by an assistant. A linear section is then made outward and below from the temporal end of the horizontal diameter of the cornea to the lower end of its vertical meridian. The nucleus can then be removed with a spoon or loop, usually without difficulty.

CAUSÉ.

XVII.—VITREOUS. Reviewed by KÜMMELL.

100. LOEWENSTEIN and SAMUELS. **Replacement of the vitreous.** *Arch. f. Ophthalmologie*, lxxx., 3, p. 500.

101. ELSCHNIG. **Replacement of the vitreous.** *Ibid.*, p. 514.

LOEWENSTEIN and SAMUELS (100, **Replacement of the vitreous**) find from their experiments on rabbits that small quantities of vitreous, 0.3 *ccm*, can be removed without harm, but a transparent medium is never restored if the loss exceeds 0.5*ccm*. Replacement of the vitreous by a 0.85% solution of salt is borne without reaction, and the vitreous almost always remains clear, except for glittering flecks, which resemble the picture of synchysis scintillans and correspond to the destroyed vitreous tissue. Vitreous opacities are caused by hyper- and hypo-tonic solutions. Ringer–Locke's solution gave better

results as regards transparency of the vitreous than anisotonic solutions of salt, but worse than isotonic.

ELSCHNIG (101, **Replacement of the vitreous**) reports the results of a number of cases in which he withdrew diseased vitreous and replaced it with an 0.85% solution of salt. In four with hemorrhage into the vitreous the result was very good, so that he recommends this procedure as the best in such cases. A good result was obtained in two out of six cases of iridocyclitic opacities. In two cases of purulent infiltration the results were temporarily good. He likewise recommends the filling of the vitreous cavity with this fluid after injuries, when the wound can be closed by sutures. More than 0.5 or 0.6*ccm* of the vitreous should never be removed and replaced; he has never seen harm result within these limits. The operation can be repeated several times.

XVIII. CHORIOID. Reviewed by KÜMMELL.

102. BACH. **Etiology and course of diseases of the uveal tract.** *Zeitschrift f. Augenheilkunde*, Jan., 1912, p. 8.

103. COATS. **Tubercle of the chorioid in cats.** *Ophthalm. Soc. of the United Kingdom*, Jan. 25, 1912.

104. TODD, F. C. **Single rupture of the chorioid involving half the circumference of the eyeball.** *Ophthalmic Record*, May, 1912.

105. SHOEMAKER, W. A. **Central guttate chorioiditis.** *Amer. Jour. of Ophthalmology*, March, 1912.

106. STIRLING. **A form of family chorioiditis.** *Ophthalmoscope*, 1912.

BACH (102, **Etiology and course of diseases of the uveal tract**) has collated 400 cases of diseases of the uveal tract and comes to the following conclusions: Iritis and cyclitis are bilateral in only 15 to 21%, while iridocyclitis and chorioiditis are bilateral in from 52 to 61% of the cases. Tuberculosis is the cause in 15% of the cases of iritis and cyclitis, in 18% of those of chorioiditis, and in 20% of those of iridocyclitis. Rheumatism is a rarer cause in chorioiditis than in iritis, from 7 to 18%. Very frequently the history and general examination furnish no guide to the etiology. The prognosis is most favorable in iritis, most unfavorable in chorioiditis, in the ratio of 70 to 40% of recoveries. Tuberculin was used in 21 cases; the result was good in some, in others it had no effect, or was of only transient benefit.

COATS (103, **Tubercle of the chorioid in cats**) reports six

cases, five of which were bilateral. The tapetum of the chorioid resists rupture; at the places where it was absent, yellowish exudations were visible beneath the vessels. Detachment of the retina took place regularly and early. The vitreous contained bands, and later iritis set in without nodules with a vascularized exudate in the pupil. Usually the other organs were also tuberculous.

TODD (104, **Single rupture of the chorioid involving half the circumference of the eyeball**) describes a rupture which began at the middle of the nasal margin of the disk and extended in a horizontal line to the periphery of the fundus, at least as far as it could be followed. It was a little wider than a large vein. It was produced by a contusion received eight years before the examination.

ALLING.

SHOEMAKER (105, **Central guttate chorioiditis**) reports three cases of central chorioiditis which were probably of inflammatory origin and caused by arteriosclerosis.

GILBERT.

STIRLING (106, **A form of family chorioiditis**) describes a family of six brothers and sisters, of whom one sister and two brothers were attacked when 8 years old with central chorioiditis which led to a high degree of amblyopia. There was no consanguinity and no manifest signs of syphilis.

GILBERT.

XIX.—SYMPATHETIC OPHTHALMIA. Reviewed by KÜMMELL.

107. DEUTSCHMANN, F. **Pathogenesis of sympathetic ophthalmia.** *Arch. f. Ophthalmologie*, lxxxi., 1, p. 36.

108. ELSCHNIG. **Papilloretinitis, neuritis retrobulbaris, and amblyopia sympathica.** *Ibid.*, lxxxi., 2, p. 356.

109. POELLOT. **A case of sympathetic ophthalmia with the condition of both eyes.** *Ibid.*, lxxxxi., 2, p. 264.

DEUTSCHMANN (107, **Pathogenesis of sympathetic ophthalmia**) found microscopically a few Gram-positive diplococci in the chorioid and optic-nerve sheath in another case of sympathetic ophthalmia. Some of the cultures remained sterile, in others Gram-positive cocci were cultivated. He claims that the agent of sympathetic ophthalmia is a Gram-positive diplococcus, and adduces in evidence a former case of R. Deutschmann's and one of Grunert's. (In the latter, neither

Grunert, nor Schleich, nor Baumgarten and Henke could find micro-organisms, while in Deutschmann's it was possible to find diplococci.) He was able to cultivate sarcinæ several times from eyes with microscopically demonstrable diplococci, and tries to prove from literature and his own experiments that yellow sarcinæ change into white diplococci, which might be taken for avirulent white staphylococci if one was ignorant of their origin, so as to explain the apparent contradiction between the microscopic and cultural findings. After an analysis of the more recent hypotheses of the abacterial genesis of sympathetic ophthalmia, he summarizes his results as follows: (1) True sympathetic ophthalmia has been produced in monkeys and rabbits by the inoculation of pieces of the chorioid of human eyes that excite the disease. (2) A Gram-positive diplococcus is the agent of sympathetic ophthalmia. Perhaps we have to see in it only a modified sarcina. (3) The disease attacks the second eye when the bacteria are able to travel along the lymph sheaths of the first optic nerve to the chiasm and from there in the lymph sheaths of the second optic nerve back to the orbit. (4) The path followed by the bacteria from the eye to the optic-nerve sheaths and the reverse, may be either direct from the chorioid into the intervaginal space, or with the anterior ciliary vessels in order to pass within the muscles of the orbit around and behind the eye to the central vessels, into the sheaths of the optic nerve, and *vice versa*. The chronic inflammatory changes in the meninges are circumscribed and cause no general symptoms.

Elschnig (108, **Papilloretinitis, neuritis retrobulbaris, and amblyopia sympathica**) reports a case in which inflammation followed a cataract extraction. Some months later the other eye began to suffer from neuroretinitis, which was thought at first to be sympathetic. The apparently exciting eye was enucleated without influencing the course of the disease in the other. Microscopically it showed no trace of the form of inflammation known to excite sympathetic trouble. The patient had at the same time an empyema of the accessory sinuses, to which the neuroretinitis was finally ascribed. From a compilation of the cases reported of sympathetic papilloretinitis Elschnig concludes that in no case of this disease has the sympathetic nature been perfectly proved. If it exists

at all, he agrees with Schirmer that under certain circumstances the toxines of the bacteria, especially the products of the breaking down of albumin, may pass to the other nerve by way of the chiasm, but no proof of this has been adduced, and the favorable effect of enucleation of the first eye speaks against this etiology. He is also sceptical concerning sympathetic simple atrophy of the optic nerve, as well as sympathetic amblyopia.

POELLOT (109, **A case of sympathetic ophthalmia**) gives the clinical history of a patient in whom an increase of tension developed after a certainly not perforating injury of the eyeball. Thirteen days later iridectomy was performed with transient benefit. The wound healed well without infection. Eight weeks after the injury the eye was enucleated and soon after that sympathetic inflammation appeared in the other eye. The microscopic examination of the first eye revealed an injury nowhere. The iridectomy wound was healed externally, but gaped a little internally and held an incarceration of the iris. The characteristic condition described by Fuchs was present in the chorioid, mostly lymphocytes, fewer epithelioid cells, rarely giant cells. The entire uvea showed the well-known changes of sympathetic ophthalmia. The papilla was œdematous. Micro-organisms were not found. Although the injured eye was not perforated and the iridectomy was without infection, Poellot believes an ectogenous infection took place through the cicatrix, which was perhaps held open for some time by the incarcerated iris. This agent must have remained latent for four weeks and then suddenly have become active.

XX.—GLAUCOMA. Reviewed by KÜMMELL.

110. BJERRUM. **Pathogenesis of glaucoma.** *Klin. Monatsbl. f. Augenheilkunde*, Jan., 1912, p. 42.

111. PRIESTLEY-SMITH. **Glaucoma problems.** *Ophthalm. Review*, Jan.–March.

112. HUSSELS. **A contribution to the pathology of glaucoma.** *Zeitsch. f. Augenheilkunde*, xxvii., 3, p. 213.

113. WEITBRECHT. **Anatomical studies of 12 cases of secondary glaucoma.** *Inaugural Dissertation*, Tuebingen, 1912.

114. DUBOIS. **A case of herpes zoster ophthalmicus and acute glaucoma.** *Tijdschr. v. Geneesk.*, 1912, No. 5.

BJERRUM (110, **Pathogenesis of glaucoma**) thinks that the fundamental cause of the syndrome of inflammatory glaucoma

is an inflammation and not an engorgement. Œdema of the lids and conjunctiva cannot be ascribed to engorgement in the uveal tract, neither can fresh posterior synechiæ, or deposits on Descemet's membrane. He thinks the inflammation is of a peculiar nature, is situated in the ciliary body, is associated with hypersecretion, and is perhaps caused by special toxines. He regards prodromata as slight inflammations that quickly pass off. His explanation of glaucoma simplex is that the pathogenic agent which causes in some cases increase of secretion and irritative inflammatory phenomena, produces in others, when less virulent, simply an increase of secretion. Secondary glaucoma, on the contrary, when due to circular posterior or anterior synechiæ, may very well be ascribed to obstruction to the outflow in the sinus of the anterior chamber, yet if toxines should appear in such an eye they might produce an irritative condition. Increase of tension after luxations of the lens he ascribes less to an increased quantity of albumin in the aqueous than to irritation of the iris and of the ciliary body, which causes a hypersecretion. Attacks of increased tension after the use of mydriatics, which have often been thought to be due to occlusion of the sinus of the anterior chamber by the contracted iris, may perhaps be caused by action of the drug to increase the secretion. The effect of meiotics is explained in a similar way.

PRIESTLEY–SMITH (111, **Glaucoma problems**) says that glaucoma simplex can be present without increase of tension when the lamina is deficient in resisting power, but ordinarily increased tension can be detected by repeated tests. Its frequent occurrence in advanced life he explains through increased blood pressure, as through increased exudation in consequence of degenerative changes in the ciliary body. A change of the perceptible fluid therefore does not probably come into account in the pathogenesis of glaucoma.

GILBERT.

HUSSELS (112, **Pathology of glaucoma**) describes clinically and pathologically a case of acute inflammatory glaucoma in which the eye was enucleated 14 days after the onset of the inflammatory symptoms. There had previously existed excavation without inflammatory changes. He lays special weight on the examination of the blood-vessels. The vortex

veins were without any considerable changes. Schlemm's canal was open and filled with blood. In its wall were pigment and round cells which particularly infiltrated the trabeculæ about it. The veins of the iris were hyperæmic, the arteries were normal; in places there was hyaline degeneration; in the ciliary body and chorioid also there was an extreme fullness of the veins with approximately normal arteries. The anterior ciliary arteries were contracted by arteritic processes, while the posterior were dilated a short distance from their passage through the sclera, although they had been contracted by sclerosis. The posterior long ciliary arteries exhibited circumscribed endarteritic proliferation. The retinal arteries were very sclerotic; in places there were hemorrhages. The central artery was endarteritic. The central vein was occluded by newly formed tissue at the lamina cribrosa. The papilla was excavated; the lamina cribrosa was not pressed back, and had cavities in front of it in the tissue.

WEITBRECHT (113, **Secondary glaucoma**) examined 12 cases of secondary glaucoma produced by a variety of causes, and found in 11 the cavities described by Schnabel.. When there was neither excavation nor bending backward of the lamina cribrosa the formation of cavities was only slight; it was greatest when the lamina was bulged outward without excavation, while when the nerve was cupped the lacunæ again decreased in extent.

Following an attack of herpes zoster of the first branch of the trigeminus, which had lasted some weeks without demonstrable disease of the cornea, came an attack of acute glaucoma. DUBOIS (114, **Herpes zoster ophthalmicus and acute glaucoma**) thinks that the irritation of the sympathetic fibres in the trigeminus was the cause. B. P. VISSER.

XXI.—RETINA. Reviewed by MEYER.

115. ROURE. **Sudden, transient amblyopia in high hypermetropia (autotoxic amblyopia).** *Annal. d'oculistique*, cxlvi., p. 348.

116. KOMOTO. **A contribution to the pathology of the so-called pre-retinal hemorrhage.** *Klin. Monatsbl. f. Augenheilkunde*, p. 309.

117. INOUYE. **Formation of retinal cysts and papillitis after inflammations of the anterior segment of the globe.** *Arch. f. Ophth.*, p. 118.

118. NAKAIZUMI. **A contribution to the pathology of retinitis cachecticorum ex carcinoma ventriculi.** *Klin. Monatsbl. f. Augenh.*, p. 290.

119. TEULIERES. **A case of retinitis proliferans.** *Archives d'ophtalm.*, xxxi., p. 723.

120. SUGANUMA. **A contribution to the pathology of pigment degeneration of the retina.** *Klin. Monatsbl. f. Augenheilk.*, xiii., p. 175.

121. IGERSHEIMER. **Retinal disease in tuberculosis.** *Ärzteverein Halle*, Feb. 7, 1912.

122. SCHIECK, F. **Perithelioma of the central retinal vessels, a long unknown clinical picture.** *Arch. f. Ophthalm.*, lxxxi., p. 320.

123. DEUTSCHMANN. **An atypical glioma of the retina.** *Zeitschrift f. Augenheilkunde*, xxvii., p. 225.

ROURE (115, **Sudden, transient amblyopia in high hypermetropia**) observed in three persons between 6 and 20 years of age a reduction of the vision to counting fingers at a short distance. Aside from this amblyopia the eyes presented no morbid signs; the hypermetropia of each was between 8 and 12 D. The vision returned to normal, without special treatment, within 14 days. Roure believes that this amblyopia is caused by chemical products in the retina, which can accumulate there in high hypermetropia in consequence of the increased claims of the accommodation. He calls the phenomenon autotoxic amblyopia. CAUSÉ.

KOMOTO (116, **Pathology of preretinal hemorrhage**) describes a case of extensive hemorrhage in the region of the macula in a patient with the hemorrhagic diathesis. He thinks that in most of these cases the extravasation is intraretinal rather than preretinal, and that true preretinal hemorrhages are met with only in the rare cases in which the papilla is involved in the hemorrhage. The fluidity of the extravasation in many cases he explains as due to a defibrinization produced by the passage of the blood through the layer of nerve fibres, in which the fibrin is deposited.

INOUYE (117, **Retinal cysts and papillitis after inflammations of the anterior segment of the globe**) reports four cases which show in common an inflammation of the anterior segment of the eyeball and cystic degeneration of the macula. He does not agree with Fuchs that the vulnerability of the macula to toxines is the reason why this place in particular is affected, but ascribes it to the similarity, *i.e.*, the poverty of the vascular supply of the ora serrata and macula. In his opinion the œdema of the retina is primary, and then comes the degeneration of the elements of the retina. A close genetic connection

exists, he thinks, between papillitis and the formation of cysts through the changed conditions of diffusion in the vitreous, which in some cases was completely fluid. Diseases of the blood or of the vessels may be the cause of the hemorrhages. The vascular changes may, on the other hand, be secondary to the action of the toxines.

NAKAIZUMI (118, **Pathology of retinitis cachecticorum ex carcinoma ventriculi**) studied a case of carcinoma ventriculi in which hemorrhages and white spots were observed in the retina. The former were in the layer of nerve fibres. The white spots were due to varicose hypertrophy of the non-medullated nerve fibres and the presence of fatty substances. Forms resembling nuclei in the varicose fibres corresponded to swollen axis-cylinders. The fatty substances were cholesterin ether and phosphates, which appear in the white spots through exogenous formation of fat, perhaps lipæmia.

TEULIERES (119, **Retinitis proliferans**) observed in a young woman 21 years old a retinitis proliferans which had developed from recurrent hemorrhages into the vitreous in dysmennorrhœa. There was a large hemorrhage into the vitreous which became absorbed and organized fairly quickly; at the same time an inflammatory reaction of the retina and chorioid was excited by contact with the masses of blood, which resulted in a proliferation of Mueller's fibres. CAUSÉ.

SUGANUMA (120, **Pathology of pigment degeneration of the retina**) found in an eye with retinitis pigmentosa, which had been enucleated because of injury from a patient 67 years old, that the pigment degeneration of the retina is not a disease caused by disturbance of the circulation in the choriocapillaris, but is an independent disease of the retina. The destruction of the neuro-epithelium is due to the sclerosis of the retinal vessels, or else both of these morbid symtoms are to be ascribed to a single cause as yet unknown. The pigment infiltration of the retina is a secondary phenomenon which is caused mainly by the entrance of the proliferating bands of pigment epithelium in the pathologically dilated spaces in the tissue, especially in the perivascular lymph spaces.

IGERSHEIMER'S (121, **Retinal disease in tuberculosis**) cases confirm the statement that tuberculosis is often the cause of disease of the retinal vessels and of its consequences, such as

hemorrhages into the vitreous. In the four cases reported, treatment with tuberculin gave no better result than the older methods.

SCHIECK (122, **Perithelioma of the central retinal vessels**) reports finding an extremely rare tumor of the fundus, a perithelioma of the central vessels, a form of tumor that occurs in the brain and is malignant. The case is similar to one reported by Salzmann except that in the latter the tumor lay behind the globe and penetrated into it.

DEUTSCHMANN (123, **Atypical glioma of the retina**) observed a glioma of the retina in each eye of a child. The tumor, about as large as a pea in one eye underwent almost total involution under inunctions and injections of kakodyl. The other eye was enucleated. The peculiarity of the tumor was that it started from the pigment epithelium and showed its malignant character by numerous metastases in the retina and some into the chorioid, which cannot be looked upon as scattered embryonal cells, but as pigment cells transformed into tumor cells. The only explanation, according to the author, is a sort of retrogression of the cells to conditions similar to embryonal, associated with a markedly increased tendency to subdivision.

XXII.—OPTIC NERVE AND THE VISUAL TRACT. Reviewed by MEYER.

124. COATS. **Concretions in the papilla and corpora amylacea in the retina.** *Ophthalm. Soc. of the United Kingdom*, Jan. 25, 1912.

125. PADERSTEIN. **Colloid formations on the right optic-nerve head.** *Berl. Ophth. Ges.*, 1912.

126. KOYANAGI. **A case of primary tumor of the optic nerve.** *Klin. Monatsbl. f. Augenheilkunde*, 1912, p. 283.

127. KRAUSS. **A primary tumor of the optic papilla.** *Zeitschrift f. Augenheilkunde*, xxvii., p. 142.

128. DUBOIS. **A case of monolateral rhinogenous papillitis.** *Nederl. Tijdschr. v. Geneesk.*, 1912, vol. i., No. 5.

129. PIERRE MARIE and LERI. **Clinical and anatomical studies of cortical blindness.** *Recueil d'ophtalmologie*, p. 228.

COATS (124, **Concretions in the papilla and corpora amylacea in the retina**) found in an eye enucleated because of sarcoma of the iris mineral deposits of a wavy concentrically laminated structure on the papilla. At first they are small round bodies

and they grow by superficial accretion. They lie not encapsuled in the nerve substance. Numerous corpora amylacea show that they come from the neuroglia and not from the myelin sheaths. The concretions and the corpora amylacea occur together either accidentally, or they have a common origin, but the one is not dependent on the other.

PADERSTEIN (125, **Colloid formations on the right optic-nerve head**) reports a case of colloid formations on the papilla which simulated perfectly the appearance of atrophic discoloration. Vision and visual field, even for colors, were normal, so it could not be mistaken for a case of atrophy with secondary colloid deposits.

KOYANAGI'S (126, **Primary tumor of the optic nerve**) case of primary tumor of the optic nerve presented the two following characteristics microscopically: (1) Development of the tumor in the interseptal spaces without marked involvement of the septa; (2) the presence mainly of spindle cells, and finally the appearance of homogeneous gelatinous masses in the tumor tissue as intercellular basal substance.

KRAUSS (127, **Primary tumor of the optic papilla**) observed a tumor of the papilla in a patient 26 years old. Tuberculosis and syphilis were excluded. Inunctions were of no benefit. The eye was then enucleated and the tumor was found to be an angiosarcoma or perithelioma of the walls of the central vessels.

In the case reported by DUBOIS (128, **Monolateral rhinogenous papillitis**) the vision began to fail after the evacuation of the empyema in the posterior ethmoidal cells, and he was able to observe the development of the papillitis from the beginning. Both the papillitis and the vision improved after some weeks. Pressure can therefore be excluded as the cause of the papillitis in this case. B. P. VISSER.

PIERRE MARIE and LERI (129, **Clinical and anatomical studies of cortical blindness**) had the opportunity to examine the brains of three persons who had suffered from cortical blindness during life. In all three there was a bilateral focus of softening in the visual center, although the foci exhibited great differences as regards their extent both in surface and depth. In two cases the touching of the lower convolution of the calcarine fissure by the focus of softening on the left side

sufficed to cause hemianopsia on the opposite side. The extent of the focus of softening in cases 2 and 3 directly favored the theory that the cuneus is a part of the visual center, although they do not prove it to be such. At all events it is shown that the hemianopsia is the more extensive and the more marked the nearer the lesion is situated to the convolutions of the calcarine fissure. The continuance of the central vision, when this can be detected, and the different degrees to which the right and left sides of the field are blinded, serve as a basis for the clinical diagnosis, but the former is usually not to be detected because of the peculiar mental and psychical conditions of the patients. The condition of the vision often seems to be paradoxical; there is a distinct tactile and visual agnosia. In the same way the power of recollection of objects and the power of orientation in regard to space and time are destroyed. Occasionally, on the other hand, the very good mental conditions of these patients are surprising. The persistence of the pupillary reaction has been held to indicate that the focus of disease lay behind the corpus geniculatum externum, where the pupillary fibres leave the visual tract to go to the center of the oculomotorius, but these authors think that perhaps the explanation of the preservation of the pupillary reaction is that the impression to light is preserved and that only its interpretation is destroyed. A later work is to deal more in detail with the microscopic condition. CAUSÉ.

XXIII.—DISEASES CAUSED BY ACCIDENTS, INJURIES, FOREIGN BODIES, AND PARASITES. Reviewed by MEYER.

130. ROCHE. **Tar thrown violently into the eyes.** *Annales d'oculist.*, cxlvi., p. 345.

131. POSEY, W. C. **Shrunken globe enveloping an unusually large fragment of steel.** *Annals of ophthalmology*, April, 1912.

132. HENDERSON, F. L. **A case which demonstrates the hardihood of the human eye.** *Amer. Jour. of Ophthalmology*, March, 1912.

133. BEHR, C. **Choked disk following perforating injuries of the globe.** *Klin. Monatsbl. f. Augenheilkunde*, Jan., 1912, p. 56.

134. v. HIPPEL. **Extractions of non-magnetic foreign bodies.** *Muench. med. Wochenschrift*, 1912, p. 728.

135. MCCOOL, J. L. **Rupture of Descemet's membrane due to a blow from a blunt object.** *Ophthalmology*, April, 1912.

A cask of Norwegian tar, which had stood all day in the sun, exploded and some of its contents were driven into the eyes of a workman so that he could no longer see. On examination ROCHE (130, **Tar thrown violently into the eyes**) found both corneæ covered with a black layer of tar and the eyes much irritated. After the eyes had been cocainized the shell of tar was carefully removed from the subjacent clear cornea. Recovery took place in a few days leaving no traces.

CAUSÉ.

A piece of steel measuring 28*mm* by 16*mm* enveloped in a shrunken eyeball was removed by POSEY (131, **Shrunken globe enveloping an unusually large fragment of steel**). The injury occurred five years before and did not occasion sympathetic ophthalmia. ALLING.

In HENDERSON'S (132, **Case which demonstrates the hardihood of the human eye**) case a piece of glass 12*mm* long, 5½ *mm* broad, and 1*mm* thick entered the eye 5*mm* from the temporal margin of the cornea and caused no inflammation until its removal 40 days later. GILBERT.

BEHR (133, **Choked disk following perforating injuries of the globe**) had the opportunity to see the development of typical choked disk, both ophthalmoscopically and microscopically in six cases of perforating wounds and diseases of the anterior segment of the globe which were associated with great hypotony. A considerable prominence of the papilla was produced by a great œdema in which there were little or no signs of inflammation. The œdema was confined to the intraocular part of the optic nerve and stopped at the lamina cribrosa. Toxic and inflammatory causes were excluded. According to Behr an accumulation of fluid is caused to take place in the head of the optic nerve by the hypotony existing in the above-mentioned diseases.

V. HIPPEL (134, **Extractions of non-magnetic foreign bodies**) reports the extraction of 12 non-magnetic foreign bodies from the vitreous. In five enucleation had to be performed at once. Of five eyes that were operated on successfully one had to be enucleated later. Useful vision was saved in three, detachment of the retina took place in one. A meridional section was made in all and the foreign body was removed with forceps under a strong electric light.

McCool (135, **Rupture of Descemet's membrane due to a blow from a blunt object**) saw an eye which had received a severe contusion from a piece of metal and observed a Y-shaped figure in the deeper parts of the cornea with other smaller lines about it, denoting a rupture of Descemet's membrane. The anterior chamber was partly filled with blood and there was also some œdema of the cornea. The eye recovered with practically normal vision. ALLING.

BOOK REVIEWS.

I.—Ophthalmoskopische Diagnostik (Ophthalmoscopic Diagnosis), based on typical pictures of the fundus oculi with reference to cases of importance for general medicine, for physicians and students. By Dr. C. ADAM, Assistant at the Royal University Eye Clinic, Berlin. 86 colored drawings. Urban and Schwarzenberg, Berlin and Vienna, 1912. Price, 21 Marks.

This book differs from most text-books on ophthalmoscopy because the making of a diagnosis from the ophthalmoscopic lesion is the all-important aim rather than merely a pictorial representation of the fundus condition. The author as a pupil of the late v. Michel has been thoroughly impressed with the important relation between the eye and general diseases. The book serves therefore as a text-book with the broadest foundations, whose careful study must be of the greatest benefit. The author deserves great credit for again pointing out in a masterly way the importance of a general medical knowledge in the correct interpretation of a fundus change, for, with very few exceptions, do not all ophthalmoscopic lesions represent a disturbance of the general health? After a brief description of ophthalmoscopic technic and of the normal fundus, the optic nerve, the retina, and the choroid are taken up in turn, describing the anatomy, the general and special diagnosis of the pathologic variations. The text is clearly written, and instructive. The illustrations are excellent; the one of a beginning glioma retinæ is particularly remarkable. The book-making is fully up to the standard, and the price very low. A. K.

II.—Ophthalmic Surgery. By Dr. JOSEF MELLER, First Assistant at the Clinic of Professor Fuchs, Vienna. Edited by

Dr. W. M. SWEET, Philadelphia. With 173 illustrations. Second Edition. Philadelphia, P. Blakiston's Son & Co., 1912. Price, $3.50 net.

Meller's excellent book on eye operations, as practiced in the Fuchs clinic, has in this new edition been thoroughly revised with the aid of the editor, Dr. Sweet. The subject-matter has been rearranged, a description of new operations added, and the list of illustrations has been increased. The book, in its new form, will be a great assistance to those desirous of profiting by the experience of the large operative material which the Fuchs clinic commands, not to mention those from all over the world who begin their training in eye operations at that clinic. The methods of operations, and the indications, are those which have stood the test of time; there can be no better recommendation. A. K.

III.—Das Trachom nach dem gegenwärtigen Stande der Forschung (The Present State of our Knowledge of Trachoma). By Prof. Dr. G. STANCULEANU and Dr. D. MICHAIL (Bucharest). J. Safar, Wien-Leipzig, 1912.

The authors cover in a lucid and practical manner the subject of trachoma in a monograph of 73 pages. Special chapters take up the definition and history, the etiology, pathologic anatomy, evolution and complications, the differential diagnosis and treatment of trachoma. Two maps showing the geographical distribution of this disease and the chapter dealing with the subject of prevention deserve special attention of the reader. The authors regard the so-called "trachoma bodies" as products of degeneration of the protoplasm and nuclei of the epithelial cells of the conjunctiva, and they give illustrations of such cells, containing the "trachoma bodies" found even in chalazions. The monograph contains numerous personal researches and valuable clinical observations based upon zealous laboratory work and upon observations of a very large number of patients with trachoma who flock from all over Roumania to the eye clinic of "Spitalul Colzea" of Bucharest. It is interesting to note the attempt of the authors to work out a complement fixation test for the serum of patients with trachoma.

In the chapter describing the various types of trachoma we

read about a form—not described in text-books—which involves especially the bulbar conjunctiva, giving earlier and more frequent complications on the cornea than any other type of trachoma. The authors recommend and describe in detail the use of the tooth-brush after the method ("grattage") of late Prof. Manolescu. This method has been almost exclusively used by Roumanian ophthalmologists for the past twenty-five years among a population very rich in trachoma, and the writer of these lines, who has seen Prof. Manolescu's work, entirely agrees with Stanculeanu and Michail, who praise the "grattage" as the shortest and most successful method of treating trachoma. M. J. SCHOENBERG.

IV.—Anatomy and Histology of the Human Eyeball in the Normal State, its Development and Senescence. By Professor M. SALZMANN, Graz. Translated by Dr. E. V. L. BROWN, Chicago. With 5 text figures and 9 plates. The Chicago Medical Book Co., Chicago, 1912. Price, $5.00.

Salzmann's ***Anatomy of the Eye*** was reviewed when it first appeared in German, in these ARCHIVES, p. 203, vol. xli., 1912. It now appears in an English translation by Dr. E. V. L. Brown, together with the original plates. The many excellent features of Salzmann's ***Anatomy*** are now available to a wide circle of readers through the enterprise of Dr. Brown; for it is not always easy to obtain a publisher for a translation of a purely scientific book. The work of the translator deserves favorable comment; the German text, which is excellent, has not suffered in its translation. It should be stated that this book is not solely an anatomic treatise, but it has frequent references to ophthalmoscopy and to pathologic processes.

A. K.

V.—The Ocular Muscles. By H. F. HANSELL and W. REBER of Philadelphia. With 3 plates and 82 other illustrations; pp. 223. Second edition. Philadelphia: P. Blakiston's Son & Co., 1912. Price, $2.50 net.

Hansell and Reber's little book on the muscular anomalies of the eye now appears in a new, rewritten, and enlarged edition. It is a practical and conservative guide to the study of this important subject. A. K.

VI.—Practical Exercises in Physiological Optics. By GEORGE J. BURCH. Crown 8vo, pp. 164. Oxford: At the Clarendon Press, 1912. Price, $1.35.

This is a laboratory manual of experiments in physiological optics. It is divided as follows: Section I.—Methods for Determining the Constants of a Lens. Section II.—Dioptrics of the Eye. Section III.—Judgments. Section IV.—Sensations of the Eye. Section V.—Color Blindness. Section VI.—Phenomena of Flashing Light.

The descriptions are clear and do not demand too deep a knowledge of mathematics, so that it is to be hoped that this book will stimulate the study of this often neglected subject.

A. K.

VII.—Die Störungen der Sehfunktionen (The Disorders of the Visual Functions). By Dr. W. LOHMANN, First Assistant of the University Eye Clinic, Munich. With 39 illustrations, in part colored. Pp. vii+, 206. Published by F. C. W. Vogel, Leipzig, 1912. Price, 10 Mk.

A book planned to fill a space in our literature hitherto unoccupied deserves a careful and extended review. Prof. Lohmann's effort to describe the disorders of the visual function is admirable in many respects; it leaves something to be desired, however, in that it attempts to cover a very large field in a comparatively small compass. This entails omissions of much that might be interesting and a condensed treatment of certain subjects with the sacrifice of clearness. The text is interspersed with quotations of articles and references to sources with which the author is evidently quite familiar, but which to the unversed reader provide merely an introduction, although, it may be granted, a very stimulating one. Often the gist of long and tedious research is given in a few sentences, and in a manner easily available. In some instances, however, a clear and simple restatement is hardly to be expected, much less a condensation.

It is not so much a text-book of physiological optics as an attempt to apply to morbid phenomena the principles of Helmholtz, Hering, and many others, and to deduce from the pathological, evidence applicable to the normal.

Opinions may vary as to the success of the author in his

ambitious effort, but there can be no question regarding his fitness for the task. The book shows a very thorough training, chiefly, it would seem, in the laboratory, and a broad grasp of the subject as shown by the clear statement of difficult questions such as light sense and adaptation, theories and defects of color vision and binocular vision, as well as by brief excursions into the wide field of psychology and æsthetics. In many respects, the connecting link between theory and practice is suggested, although the author disclaims any utilitarian intent. It is possible to touch upon only a few of the salient points in detail.

Dioptrics as well as certain other important parts of ophthalmology are not treated at length, reference being made to the special work of Hess and others in Graefe-Saemisch. Gullstrand's important work on ***Astigmatic Vision*** might have received more than a passing allusion.

Hypermetropia is described as a condition of imperfect development, and with it are grouped congenital amblyopia, imperfect fusion power, and amblyopia from disuse—an excellent generalization, and in this connection Worth's services are recognized.

The conflicting opinions of Krusius and Straub are fairly stated. In 90 per cent. of his cases of congenital amblyopia, Heine found a central scotoma, and the author expresses the opinion that most of the cases of amblyopia from disuse belong in this class.

In the consideration of congenital amblyopia the author states that a 5*mm* colored object disappears in the normal eye at a distance from the center equal to $\frac{1}{10}$ vision—that is, at about 8°, according to Dor's diagram. Granting the approximate nature of peripheral measurements, this estimate is too faulty to serve as a premise for such fine conclusions.

The clinical distinction between scotomata due to traumatism at birth and those depending on a supposed structural defect is hardly tenable or at least is not proven. An interesting application of the "Flimmer test" is attempted for the solution of the problem, and the author's results seem to show that the function of the center in the amblyopic eye, as shown by this test, is similar to the periphery. This test does not seem to be of general value.

Retrobulbar neuritis is given a brief consideration, with references to enlargement of the blind spot in disease of the sinuses, and to Fuchs's recent contribution to the symptomatology of tabes.

Peripheral defects of the field in glaucoma, atrophy, diseases of the choroid and retina, and psychic contractions are treated more fully, with numerous references.

A long chapter on Adaptation and Hemeralopia offers much of theoretical interest, but leaves one with a confused sense of the various methods of examination and the uncertain results. The occurrence of the inverted type of the color field in hemeralopia, particularly that due to icterus, suggests the need of the examination of cases of choked disk, to ascertain whether the phenomenon described by Cushing, if it should be associated with hemeralopia, may be attributed to œdema of the retina.

The theory of the functions of the rods and cones, called "Duplizitätstheorie," first proposed in its complete form by Parinaud and von Kries, opposed by Hess, Hering, and others, is discussed as clearly as the limited space permits and is worth a careful reading.

A discussion of color is not apt to offer much that is new, but it is a distinct merit for a review of the familiar theories to be lucid, even if it leaves the reader in his previous state of indecision. The author's statement will find ready acceptance in that there is apparent at the present time a certain fatigue with regard to the many theories and that investigators should be content with the study of phenomena, especially in the comparatively unexplored field of acquired color defects, until a new Kant appears to bridge the space between the subjective and the objective.

The description of congenital defects of the color sense, especially "Anomale Trichromasie" and "Farbenschwäche," is extremely interesting, scholarly, and lucid. The author lays stress on the importance of instruction in these little understood parts of a large and vital subject.

Short chapters on acquired defects of color perception and chromatopsia, and one on color audition (audition colorée), show the author's scope and add to the charm of this unusual book.

After this excursion the treatment of binocular vision is at

first somewhat involved and too condensed for perfect clearness, but the different views are stated, without attempt at conclusions, and the numerous references will lead one to consult the original articles to which the author has frequently contributed.

Much space is given to the discussion of phenomena associated with hemianopsia, and the title of the final chapter, "Gedächtnisbilder; Optische Begleit und Trugwarnehmungen," in which the speculative or psychological interest predominates, indicates the scope of the book which gives it a place apart, complementary to the text-book which deals with practical problems, a definite solution of which is of most consequence and may be reasonably expected.

The book is well printed, on glazed paper. The index is not as complete as could be desired for convenient reference. There are a few minor errors, the enumeration of which would serve no useful purpose.

C. W. CUTLER.